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WORKING PLAN

FOR

THE SALEM NORTH FOREST DIVISION

1949-50 TO 1963-64

BY
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Assistant Conservator of Forests

Under the direction of the Conservator of Forests
Working Plans Circle

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INTRODUCTION.

The last Working Plan dealing with the forests of Salem North Division was drawn up by Mr. C. R. Ranganathan, M.A., I.F.S., and was sanctioned in Chief Conservator's Proceedings No. 205, Press, dated 27th April 1937. The period of this plan was from 1935–36 to 1944–45.

The present revised Working Plan deals with the area covered by the last working plan, and some additional areas merged in Salem North Division subsequently due to the abolition of Salem Central Division in 1938 and due to the resumption of some panchayat reserves by the Forest Department during 1948. The revision of the Working Plan was undertaken by Sri K. A. Muddayya on 12th June 1947. Though the Working Plan Division was wound up on 22nd October 1948 the final draft of the plan was ready only in July 1949 as the original draft had to be revised materially in the Conservator's office and supplemented by such statistical information as was found lacking in it.

The author and the Conservator, Working Plan Circle, express their thanks to the territorial staff for the co-operation and assistance given.

S. R. RAO,
Conservator of Forests, Working Plans Circle.

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A WORKING PLAN FOR THE NORTH SALEM FOREST DIVISION.

PART I.

Summary of Facts on which proposals are based.

CHAPTER I—THE TRACT DEALT WITH.

Section 1—Name and Situation.

1. This working plan deals with the whole of the North Salem Forest Division, as it is at present (1948) constituted, and will be known as the North Salem Working Plan. The plan is primarily concerned with the administration of the reserved forests of the division, but it will also deal with the exploitation of forest produce, especially of sandalwood, occurring in unreserves.

2. The North Salem Division occupies the north-western corner and a few reserves in the north-eastern corner of Salem district. It is bounded on the north by the Mysore State and Chittoor district ; on the west by the Mysore State, and the Cauvery river, which forms the frontier between Salem and Coimbatore districts ; on the south by the South Salem Forest Division. The tract lies between the latitudes N. 11°–55′ and 12°–49′ and the longitudes E. 77°–29′ and 78°–27′. It is included in the Hosur, Dharmapuri and Krishnagiri taluks of the Salem district and part of Tiruppattur taluk of the North Arcot district. The boundaries which divide the tract from Mysore and the neighbouring forest districts are demarcated or naturally defined frontiers, but those which mark it off from the North Arcot district are imaginary. North Salem falls in the midst of a group of sandal-producing forest divisions Bangalore division (Mysore State) on the north, Kollegal Division on the west, West Vellore on the east and South Salem on the south.

Section 2—Configuration of the Ground.

3. The forests of the division form a more or less compact block lying between the Thoppaiar, the Cauvery and the Mysore frontier. This definition, though substantially correct, leaves out of account the Nerlapatti Maharajagodai, Medugampalli reserve, Nerlakote reserve, Bargur, Nandibanda and Kothur reserved forests which abut the Salem-North Arcot and the Salem-Chittoor district boundaries. Within this large block, there are numerous villages and extensive areas of cultivation, some of which constitute islands or enclosures inside the reserved forests. As a rule, the cultivation is confined to the flatter portions, and where the terrain exhibits abrupt changes of elevation, it is usually absorbed in jungle.

4. Except in the valley of the Cauvery where the ground sinks precipituously to less than 1,000 feet above sea level, the tract is a vast plateau falling gently or rapidly to the south and east, and leaving exposed in its fall, great ribs of hill ranges running north to south. Towards the south-east, in the tract mainly included in the Denkanikota East range, the plateau is thrown up into a crowded mass of high hills, known somewhat loosely as the Melagiris, after a peak, not the highest 4,079 feet elevation. A little further south, the plateau achieves its highest eminence in the Siddapuram plateau (3,800). Some 12 miles further south, the Melagiris culminate in the Guttirayan Drug, 4,577 feet above sea-level, the highest peak for many miles around. From Marandahalli and Royakota to the east, where the ground has sunk to less than 2,000 feet in elevation, the Melagiris appear as a formidable and impressive chain of hills ; while from Denkanikota, they appear dwarfed by the general elevation (3,000 feet) of the plateau itself. The topography of the Hosur plateau is admirably described by Le Fanu in the following extract from the Salem district Manual, 1883 :—

" The north-western portion is comparatively plain ; but broken by an interminable series of undulations, some almost ravines from their steepness, and others more gentle in their slopes . . . The more northerly portion stretching through Atthipalli and across towards Sarjapuram and on towards Bagalur and the Maisur frontier is almost quite level ; on the east, commencing west of Sulagiri and towards Uddenapalli, and thence towards Kelamangalam, comes a series of rocky hills, almost deserving the name of mountains, which stretch away towards the Krishnagiri frontier forming part of the second line of the Eastern Ghats, and resulting from the tremendous crushing which upheaved the central plateau on its bed of gneiss. On the south-east for about twenty miles, the Melagiris form an

unbroken chain, separating the taluk from Dharmapuri. The whole north and western part of the taluk as far as Jaulikeri (misnamed Jaulagiri) and Denkanikota, is on the Maisur plateau. Except where the comparatively scanty cultivation grows round the villages, this tract is generally bare and uninteresting. The gaunt ribs of gneiss crop up everywhere, and it is principally in the valleys where water is longest, that green is to be seen, these latter being often gay with areca and other palms. Beyond Jaulikeri and Denkanikota, in a line drawn from little south of the former to about three and a half miles south of Denkanikota and then onwards in a south-east direction to the Melagiris, is a most remarkable drop. The whole plateau seems suddenly to sink as if a sustaining hand had been withdrawn, and a new plateau at a level lower by several hundred feet, spreads out. A fresh line of hills bears up this plateau ; and it is only on scaling the durgam at Kunthukota that the traveller recognizes that another depth yet lies before him. Here in a line generally speaking parallel to the first and passing south of Kunthukota, there is another still more remarkable drop, which seems as though the level of Coimbatore was at last reached. To this lower depth access is gained by the so-called Anchetty Ghat ;* and even after that there are eight or nine descents before the level of Pennagaram and the Kaveri is attained *via* Natrampalaiyam† This series of rapid descents, with vast steppes spread out at the foot of each,is very beautiful. So rapid are they that filled as the lower country is with an endless variety of forest-clad peaks and cones almost crowding at the little valleys between them, an unusually large spread of country is brought into view, and a feeling of vastness, such as is inspired by one of Martin's pictures is produced. Among the many beauties of the district, the view from Jaulikeri, looking south, on a cold and blustering but bright morning in January, is perhaps the most beautiful, the Rayakota ghat taking second rank. Jaulikeri itself is in keeping with its surroundings, the quaint roofs, something of the Swiss cottage style, with their bright red tiles, giving a home look to the picture with Indian scenery so often wants ; the secret cord (sic) is touched and the exquisite pain of *heimweh* rises in the heart and gathers to the eyes. On the east, the Melagiris and on the west some minor hills enclose a verdant vale spreading to the south. In the near foreground is the picturesque peak of Madinigiri, and, like a shadow in the distant haze, the Ponachibeta in Coimbatore, its height doubled by a film of snowy cloud which drifts half way up,fills up the background of the valley; while, in the middle distance, innumerable tree-clad peak pierce the morning mist which hangs in the romantic but fever-stricken hollows. The country round has less the appearance of a table-land than of the summit of a mountain ridge ; in its flora and general aspect it looks as if some hill top had suddenly been depressed, so as to merge in the plains while retaining its distinctive scenery. Very beautiful also is the view beyond Kunthukota. The hillsides are covered with forest ; the plains below most beautiful, as the tanks under the sunlight flash out amidst the green ; the little red path along the hillside melts away into a thread in the far distance ; the air is redolent with the crushed wild thyme, and the musical tinkling of many notes is borne upwards on the breeze. It is difficult to conceive that these lovely scenes, and the glaring plains of Tiruchengode, trembling in the mirage of the midday sun, were created by the same hand. Kunthukota is as it were the *ultima thule* of civilization. A drop of 1,000 feet by Thippu's ghat leads to the wildest jungles. Here and there a squalid village struggles against the wild beasts and fever, and the official is happy when he can turn his back, with a good conscience, on the unhealthy solitude which has claimed his temporary presence. The country south-east of Denkanikota is jungly. Towards Kelamangalam on the east, and Thalli on the west, is the usual bare undulating spread of the Hosur plateau. It may generally be said that where the Balaghat‡ is least prepossessing, as towards Bagalur, it is most healthy ; and whenever it becomes beautiful it is unsafe to live in, at least for strangers."

5. A more detailed description of the tract is given below :—

" The group of hills lying to the south-east of Hosur taluk, on which, for the most part, the valuable forests of the division are situated, is known as the Melagiris. It is difficult to define the precise limits of the Melagiris, but in practice the name is applied to the broken country between the Chinnar and the Cauvery. The Chinnar in its course from near Thalli to Koginakal, where it falls into the Cauvery, describes a crescent the horns of which point westwards. A chord to this arc is formed by a massive ridge of mountains, running north-east by north and south-west by south, which culminate in the Guttirayan (4,579 feet). This ridge determines the course of the Anaibiddahalla which drains its western flank and falls into the Chinnar at Muthur. The country between the Anaibiddahalla and the Chinnar is bisected by a ravine running from west to east in the direction of Palakod. This ravine (the Kesarguli valley) at the head of which stands the hamlet of Kesarguli, is partly included in the Thirumalvadi Mitta. North of the Kesarguli valley is the Bettamugalalam plateau which contains an extensive enclosure and which, around Siddapuram, attains an average elevation

* The " Anchetty " ghat referred to is not the present forest road, but a historic route, still to be seen, which was never fit for cart traffic or even horses.

† Le Fanu is not quite correct here. The elevation of Pennagaram is not much inferior to that of Anchetty.

‡ The word literally means " above hills " ; from the Persian proposition bala above, and ghat a line of hills or pass between them. The term is a historic (but not a strictly accurate) name for the Hosur taluk.

of 3,800 feet. About half a mile south of Siddapuram, there used to be an estate called Glenshaw belonging to one Mr. Shaw, who tried to plant coffee here but failed. The highest points in the coronet of hills that surrounds this plateau are Jenkalbetta (4,118 feet) and Ijalhattikal (4,132 feet). South of the ravine the hills sink to a vast rolling plateau, about 1,800 feet in elevation guarded on the west by the high Guttirayan ridge, whose sides form an almost perpendicular wall, and on the east by the Kottaiyur Drug (3,412 feet) range. This extensive vale was once populous and cultivated, but it now, except for a few scattered hamlets, a lonely jungle. In the heart of the valley is the deserted site of Morappur village. Three miles south of Guttirayan peak, and adjoining the ridge which runs as knife edge northwards, lies the Kodagerai enclosure with an average elevation of 3,400 feet.

6. The Guttirayan peak (4,577 feet) is easily accessible from Kodageri, where there is a tolerable forest Inspection shed, the distance being three miles. The path passes through a dense patch of shola forest, in the midst of which is a large dark pool of water. The summit of the peak is bare of tree growth and is surrounded by a belt of moorland. The view from the peak is magnificent. To the west is wilderness of mountain and jungle, with here and there a patch of cultivation. In the south the Cauvery is seen winding its way through the maze of hills, and further down can be seen the waters of the great lake formed by the Mettur dam ; while to the east is a bird's eye view of the Morappur amphi-theatre and the plains beyond.

To the south-west of the Morappur valley, the course of the Chinnar (or Sanatkumara Nadi) is deflected westward by a remarkable ridge known as the Pikkili hills. But for the obstruction offered by this ridge, the Chinnar would flow into the Ponniar and not into the Cauvery. Between the ridge and the river there is a level plateau or shelf on which the once prosperous village of Pikkili with its hamlets is situated. The southern portion of the ridge rises to three peaks, Tambiroyan (3,367 feet), Kuklimalai (3,183 feet) and Addamalai (3,107 feet).

The Cauvery valley extends up to the Thoppiar, the reserved forests lying along the banks of the Cauvery and the Thoppiar. Besides these, a few scattered hills in the north-east rising from 1,500 feet to 2,000 feet form the reserved forests of Krishnagiri range.

Section 3—Geology, Rock and Soil.

7. The tract does not appear to have been geologically surveyed. The underlying rock is a gneissic formation with trap dykes traversing it. A remarkably fine quartz reef exists near Gummalapuram to the north-west of Thalli.

8. The soil is chiefly red and sandy loam ; black soil is exceptional. The red soil is derived from the decomposition and weathering of the underlying more or less ferruginous rocks, especially the hornblendic varieties. Alluvium is very rare, except along the Cauvery and Chinnar rivers. Samples of lateritic soils, as well as of kaolin, are found in the Javalagiri and Thalli reserves. The kaolin soils are much subject to gully erosion and are deficient in tree growth, almost the only species found on them being *Shorea talura*. Parts of the Thalli reserve contain a fertile but shallow soil resting on impenetrable rock and the flora is in consequence a mixture of dwarfed tree species. Slips of red clay are common in the Denkanikota ranges. A general deficiency of lime in the soil in sandal tracts has been observed by the Indian Institute of Science.

The soil in the reserves in the north-east corner of the division is boulder on hill tops but the soil in the valleys are generally red loam or gravelly. It is almost red gravel along the Thoppiar.

Section 4—Climate.

9. Owing to its great elevation, the Hosur plateau proper, which includes the Denkanikota ranges and a large part of Dharmapuri range, enjoys a charming and salubrious climate for nine months of the year. From the middle of March till the middle of June when the south-west monsoon sets in, the weather is very much that of the low country. On the lower Anchetti and Dharmapuri plateau the climate is warmer but not unpleasant, while in the Cauvery valley, where the ground falls to less than 1,000 feet, it is hot for the greater part of the year. On the Hosur plateau the temperature rarely exceeds 90 in the shade even in the hottest months while the minimum temperature sinks to less than 60 in December and January.

10. The division as a whole is healthy, the incidence of malaria being low. Plague is however endemic in many of the plateau villages.

11. *Rainfall.*—There are twelve forest raingauge stations in the division. The following shows the average monthly rainfall recorded at the various stations over a series of years. Detailed annual statements will be found in Appendix II.

Statement showing the average rainfall in inches.

Name of station.	*Average rainfall in inches.*						
	January.	*February.*	*March.*	*April.*	*May.*	*June.*	*July.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Denkanikota	0·30	0·57	0·74	2·83	5·36	1·56	2·15
Javalagiri	0·11	0·34	0·82	3·79	5·37	3·43	3·22
Devarbetta	0·08	0·23	1·07	2·66	5·25	2·27	4·00
Marandahalli	0·47	0·57	0·91	4·07	7·26	2·97	1·80
Thoppur	0·32	0·25	1·34	2·55	5·29	2·74	1·79
Pennagaram	0·08	0·34	1·00	2·55	4·79	3·19	2·12
Aiyur	0·45	0·70	1·07	3·10	6·04	2·33	2·47
Anchetty	0·10	0·51	1·27	3·15	5·37	1·68	2·01
Medugampalli	..	0·28	0·67	2·54	3·27	0·55	2·23
Krishnagiri	0·27	0·392	0·83	2·85	5·68	1·81	2·18
Biligundlu	0·11	0·30	1·38	1·37	2·11	0·96	1·09
Urigam	0·02	0·07	1·31	1·40	3·01	0·30	1·00

Name of station.	*Average rainfall in inches—*cont.					
	August.	*September.*	*October.*	*November.*	*December.*	*Total.*
	(9)	(10)	(11)	(12)	(13)	(14)
Denkanikota	4·46	6·09	6·75	3·95	0·83	35·59
Javalagiri	5·62	5·37	7·11	2·23	0·80	38·21
Devarbetta	4·69	6·09	5·68	2·09	1·36	35·47
Marandahalli	5·74	8·35	10·30	6·10	2·05	50·59
Thoppur	4·55	5·41	6·33	3·45	1·49	35·51
Pennagaram	3·66	6·34	6·44	4·07	1·70	36·28
Aiyur	5·24	5·82	7·74	5·29	2·36	42·61
Anchetty	5·33	4·56	5·87	2·41	0·74	30·00
Medugampalli	3·84	5·31	6·80	1·68	1·10	28·27
Krishnagiri	4·09	6·48	5·90	3·03	1·45	34·86
Biligundlu	2·52	1·66	6·39	3·49	0·26	21·64
Urigam	2·89	3·00	7·38	2·90	..	23·28

For Denkanikota the average is calculated for years 1935 to 1946.
For Javalagiri the average is calculated for years 1935 to 1945.
For Devarbetta the average is calculated for years 1935 to 1946.
For Marandahalli the average is calculated for years 1935 to 1946.
For Thoppur the average is calculated for years 1939 to 1946.
For Pennagaram the average is calculated for years 1935 to 1946.
For Aiyur the average is calculated for years 1935 to 1946.
For Anchetti the average is calculated for years 1935 to 1946.
For Medugampalli the average is calculated for years 1943 to 1946.
For Krishnagiri the average is calculated for years 1936 to 1946.
For Biligundlu the average is calculated for years 1942 to 1946.
For Urigam the average is calculated for years 1943 to 1946.

SECTION 5—WATER-SUPPLY.

12. A list of perennial and semi-perennial streams in the division is given below: —

Range.	Perinial stream.	Semi-perinial stream.
Denkanikota East	Chinnar	Thabgulvanka. Hebbahalla.
Denkanikota West	Ponniar	Metrevanka. Durgamvanka.
Dharmapuri	Cauvery	Chinnar. Periapallam.
Anchetti	Cauvery	Doddahalla. Kallumaduvuhalla. Anaibiddahalla.
Krishnagiri	Ponniar	Gandanaigapallam. Mattur vanka. Pambar.

Of the above, the Cauvery and the Chinnar are the most important sources of water-supply. The Chinnar which takes its rise near Thalli and traverses the plateau has been dammed at Marandahalli for irrigation purposes. The river is perennial down to the dam, but below it its flow becomes attenuated and uncertain. The bed of the Cauvery is carved, within the limits of this division, through a maze of rocky hills which do not permit of its water being tapped for irrigation. There exist on the plateau and the plains numerous tanks, small and large, which provide water for men and cattle. Besides being unwholesome, these tanks have, in recent years, proved to be uncertain sources of water-supply as

they dry up during the hot weather. So far, however, as cattle are concerned, there is no lack of water facilities on the plateau while, along the Cauvery and the Chinnar, where most of the pens are situated, the water-supply is abundant and unfailing.

13. The water-supply for departmental buildings and subordinates' quarters is, generally speaking, unreliable and unwholesome. The subjoined statement shows the nature of the water-supply for the various departmental buildings.

Statement showing the nature and quantity of water-supply of all departmental buildings in North Salem Division.

Station. (1)	*Source of supply.* (2)	*Remarks.* (3)
	Denkanikota East Range.	
Denkanikota.		
Range Officer's quarters and outhouses. Range office .. .. .. Sandalwood godown .. .. Bull shed - Final cleaning depot —Timber shed—Extensions of final cleaning depot.	Draw-well	The well is in the Range Office compound. Water is brackish and not used for drinking purposes, but used only for watering plants. Drinking water is got from the tank about 1½ furlongs from the office.
Aiyur.		
Rest-house and its outhouses Sandalwood godown—Forester's sheds.	Two draw-wells, one old and one new.	The wells are close to the rest-house compound. One well contains good drinking water, never failing. The other well is not in use and it had been condemned.
Siddapuram.		
Inspection shed	Village step-well	The well is about two furlongs from the inspection shed. Drinking water is available throughout the year. It is liable to be contaminated by villagers and cattle. Water is unwholesome.
Gulhatti.		
Inspection shed and its outhouses.	Village step-well and one draw-well.	The step-well is about three furlongs from the inspection shed. Drinking water is available throughout the year. It is liable to be contaminated by villagers and cattle. Water is unwholesome. The draw-well is about half a furlong from the rest-house compound. Water is good.
Manchi.		
Outhouses to inspection shed which had been demolished.	Village step-well and draw-well.	The well is about two furlongs from the inspection shed. Drinking water is available throughout the year. It is liable to be contaminated by villagers and cattle. Water is unwholesome. Water in the draw-well is good.
Sivanapalli.		
Sandalwood godown—Forester's quarters.	Village draw-well ..	The well is within one furlong of the Forester's quarters. Good water is available throughout the year.
Gonumakanapalli.		
Sandalwood godown ..	Village draw-well	The well is within one furlong. Water is good and available throughout the year.
Kodagerai.		
Inspection shed	Village step and draw-well.	Both are about a furlong off and the water is good.
	Denkanikota West Range.	
Denkanikota.		
Rest-house and outhouses—Range Officer's quarters and outhouses—Range Office.	Draw-well	The well is close to and in front of the Research Range Office within the Range Office compound. Water is good. The source is unfailing.
Javalagiri.		
Rest-house and outhouses—Sandalwood godown—Forester's quarters.	Draw-well	The well is about 100 yards from the rest-house. The water is good. The source is unfailing.
Devarbetta.		
Sandalwood godown—Inspection shed and outhouses.	Well ..	The well water is good and unfailing.
	Village tank	The tank is within a furlong of the inspection shed. Water is unwholesome, liable to be contaminated by villagers and cattle. The source is unfailing.
Madakallu.		
Inspection shed	Step-well	The well is within a furlong of the inspection shed in the unreserve. Drinking water is available throughout the year. It is liable to be contaminated by villagers and cattle. Water is unwholesome.
Rest-house and outhouses ..	Two wells	One well contains good water, the other is condemned.

Station. (1)	*Source of supply.* (2)	*Remarks.* (3)
	Dharmapuri Range.	
Dharmapuri.		
Range Officer's quarters—Range Office—Sandalwood godown.	Draw-well	The well is within the Range office compound. Water is available throughout the year. Drinking water is got from the town.
Pennagaram.		
Inspection shed and outhouses.	Draw-well	The well is within the compound of the inspection shed. Good drinking water is available through out the year.
Muthur.		
Inspection shed and outhouses.	Draw-well and the river Chinnar.	Water is good.
Hogainakal.		
Rest-house and outhouses ..	The river Chinnar and the river Cauvery.	Water is good.
Thoppur.		
Subordinates' quarters ..	A well and Thoppur ..	Water is in front of the subordinates' quarters. Water is good and available throughout year.
Mudugampatti.		
Subordinates' quarters ..	A well	Water is good.
	Anchetti Range.	
Anchetti.		
Range Office—Range Officer's quarters and outhouses—Sandalwood godown—Rest-house and outhouses.	Draw-well and the stream.	The well is within the compound. Its water is brackish and never failing. Water in the stream is good and available throughout the year.
	Draw-well in private land.	The well is about 200 yards from the rest-house. Water is good and never failing.
Natrapalayam.		
Rest-house and outhouses ..	Stream and well	Water in the stream is good but lasts only for 9 months in the year. Well contains brackish water only for part of the year.
Biligundlu.		
Kitcheni	The Cauvery river	Good water is found in the river throughout the year.
Urigam.		
Rest-house and outhouses—Subordinates' quarters	Well	It is about 60 yards from the rest-house. Fairly good water is available throughout the year.
	Village draw-well ..	Water is good and never failing.
Gerhatti.		
Inspection shed and outhouses.	Step-well	Water is unwholesome and hence unfit for cooking or drinking purposes.
	Draw-well	Good drinking water is available.
	Krishnagiri Range.	
Range Office—Range quarters.	Draw-well	Good water is available throughout the year.
Gerigapatti.		
Inspection shed and outhouses.	Village well and stream ..	Both the well and the stream are about 3 furlongs from the inspection shed. Water is good.
Marandahalli.		
Inspection shed and outhouses (out-house is thatched building in a dilapidated condition).	River Chinnar and the channel.	About four furlongs from the inspection shed. Good water is available throughout the year.
Bettamugalalam.		
Subordinates' quarters ..	Draw-well	Good water is available throughout the year.
Medugampalli.		
Rest-house and outhouses ..	Village well	Water-supply is unfailing and good.
Maharajagadai.		
Inspection shed and outhouses.	Village well	Water-supply is satisfactory.

Besides the abovementioned water sources, there are several tanks dug in the various reserves to facilitate watering of cattle.

SECTION 6—DISTRIBUTION AND AREA.

14. The aggregate area of reserved forests in the division, which are under the management of the Forest Department, is 444,550·235 acres or 694·610 square miles. The division contains the following five ranges:—

Name of range. (1)	Headquarters. (2)	Area in acres. (3)
1 Denkanikota, East	Denkanikota	46,227
2 Denkanikota, West	Do.	52,693
3 Dharmapuri	Dharmapuri	156,324
4 Anchetti	Anchetti	129,517
5 Krishnagiri ..	Krishnagiri	59,789

15. The forests are divided into forty-seven beats for purposes of protection. The following statement shows the distribution of the beats in the various ranges :—

Name of beat.	Area in acres.	Headquarters.	Staff. Guards.	Staff. Watchers.	Reserves included in the beat.
(1)	(2)	(3)	(4)	(5)	(6)
		Denkanikota East Range.			
1 Denkanikota	3,916·00	Denkanikota ..	1	1	Denkanikota and extension.
2 Aiyur	11,279·00	Aiyur	1	1	Aiyur and extensions.
3 Tholavubetta ..	9,754·00	Thottikuppam ..	1	1	Sameri and Tholavubetta.
4 Manchi	9,258·00	Sivanapalli ..	1	1	Manchi and portion of Kempakarai west of Hebbahalla.
5 Gulhatti	8,452·00	Gulhatti	1	1	Gulhatti and Nayanasamudram Agraharam.
6 Kodagerai	3,568·00	Kodagerai	1	1	Tholuvabetta extension and portion of Kempakarai reserved forest east of Hebbahalla.

N.B.—Besides the above beat staff, this range has ten Foresters and two Special Duty Forest Guards.

Name of beat.	Area in acres.	Headquarters.	Staff. Guards.	Staff. Watchers.	Reserves included in the beat.
		Denkanikota West Range.			
1 Naganur	3,402·00	Naganur	1	1	Naganur.
2 Sanamavu	4,803·00	Sanamavu	1	1	Sanamavu and extension.
3 Pane, West ..	7,890·00	Sulakunta	1	1	Portion of Pane reserved forest west of Pane Kaderhalli foot-path.
4 Pane, East.. ..	9,497·00	Kundukota ..	1	1	Portion of Pane reserved forest east of the abovementioned path.
5 Hulibanda	8,010·00	Sulakunta	1	1	Hulibanda.
6 Javalagiri	7,763·00	Javalagiri	1	1	Javalagiri.
7 Thalli, South ..	4,560·00	Devarbetta ..	1	1	Thalli part.
8 Thalli, North ..	6,768·00	Gumalapuram ..	1	1	Thalli part and extension.

N.B.—There are ten Foresters and two Special Duty Forest Guards, besides the above beat staff.

Name of beat.	Area in acres.	Headquarters.	Staff. Guards.	Staff. Watchers.	Reserves included in the beat.
		Dharmapuri Range.			
1 Pikkilimalai ..	13,711·00	Papparapatti ..	1	1	Kesaraguli and extension Pikkilimalai.
2 Morappur	19,314·00	Dasampatti ..	1	1	Morappur.
3 Pennagaram ..	12,762·00	Pennagaram ..	1	1	Pennagaram and extension.
4 Guttirayan ..	14,669·12	Podur	1	1	Guttirayan.
5 Bevanurmalai ..	14,020·00	Buthupatti ..	1	1	Bevanurmalai and extensions.
6 Badanavadi, North	13,093·00	Gurkanpatti ..	1	1	Badanavadi and extension part.
7 Badanavadi, South.	15,010·00	Neruppur	1	1	Do.
8 Masakal	9,650·00	Mudugampatti ..	1	1	Masakal.
9 Kalapambadi ..	9,360·00	Kalapambadi ..	1	1	Kalapambadi.
10 Parigam, North ..	8,123·00	Jarugu	1	1	Parigam B (part).
11 Parigam, South ..	6,174·00	Vellar	1	1	Do.
12 Thoppur North ..	7,599·00	Dombarkompatti ..	1	1	Thoppur part.
13 Thoppur, South ..	4,534·50	Thoppur	1	1	Thoppur part and Sigarahalli.
14 Perambalai ..	8,304·00	Yerigolipatti ..	1	1	Perumbalaimalai.

N.B.—There are three Foresters and one Special Duty Forest Guard besides the above beat staff.

Name of beat.	Area in acres.	Headquarters.	Staff. Guards.	Staff. Watchers.	Reserves included in the beat.
		Anchetti Range.			
1 Anchetti	9,554·00	Thamasempalli ..	1	1	Anchetti.
2 Biligundlu	15,054·00	Thamasempalli ..	1	2	Biligundlu.
3 Natrapalayam ..	12,323·00	Natrapalayam ..	1	1	Natrapalayam.
4 Ubrani	11,940·00	Anchetti	1	1	Ubrani.
5 Taggati	10,728·00	Taggati	1	1	Taggati.
6 Urigam	11,260·00	Urigam	1	1	Urigam and Bilikal part north of Urigam Manchikondapalli path.
7 Mallahalli	20,114·00	Kottayur	1	1	Mallahalli, Bilikal part south of Urigam Manchikondapalli path.
8 Kestur	20,824·00	Manchigondapalli ..	1	1	Kestur and extension.
9 Woodapatti ..	17,720·50	Uthumalai	1	1	Woodapatti reserved forest.

N.B.—There are two Foresters and one Special Duty Forest Guard besides the above beat staff.

Name of beat.	Area in acres.	Headquarters.	Staff. Guards.	Staff. Watchers.	Reserves included in the beat.
		Krishnagiri Range.			
1 Galigattam ..	6,200·00	Balarampatti ..	1	1	Galigattam.
2 Marandahalli, North.	8,098·00	Paranjapalli ..	1	1	Marandahalli and extension.
3 Marandahalli, South.	6,176·00	Marandahalli ..	1	1	Marandahalli.
4 Hudedurgam ..	8,596·00	Nagadunai	1	1	Hudedurgam.
5 Nerlapalli	3,736·00	Nerlapalli	1	1	Nerlapalli.
6 Maharajagadai ..	12,124·00	Maharajagadai ..	1	1	Maharajagadai and extension.
7 Nerlakotai	6,912·00	Medugampalli ..	1	1	Neralakotai and Medugampalli.
8 Burgur	1,749·96	Burgur	1	1	Burgur.
9 Nandibanda ..	1,828·675	Do.	1	1	Nandibanda and extension.
10 Kothur	4,368·48	Palhur	1	1	Kothur.

N.B.—There are three Foresters and one Special Duty Forest Guard besides the above beat staff.

16. The following statements give particulars of reserved forests included in the division :—

Serial number and name of the reserved forest.	*Area in acres.*	*Reference to authority communicating section 16 notification.*	*Section 16 notification number and date.*	*Page in "Fort St. George Gazette."*
(1)	(2)	(3)	(4)	(5)
		Anchetti Range.		
1 Anchetti	9,554	....	182, dated 6th May 1887.	340, dated 10th May 1887.
2 Natrapalayam ..	12,323	....	212, dated 23rd May 1887.	404, dated 31st May 1887.
3 Biligundlu	15,054	B.P. No. 673, dated 8th December 1887.	372, dated 10th November 1887.	895 and 896, dated 15th November 1887.
4 Mallahalli	9,964	....	303, dated 23rd February 1887.	678, dated 23rd August 1887.
5 Bilikal	13,426	....	214, dated 23rd May 1887.	405, dated 31st May 1887.
6 Kestur	14,463	....	107, dated 22nd February 1887.	164, dated 22nd February 1887.
7 Kestur Extension ..	6,361	B.P. No. 387, dated 21st July 1892.	280, dated 15th May 1892.	792, dated 21st August 1892.
8 Urigam	7,984	....	324, dated 19th August 1905.	652, dated 22nd August 1905.
9 Tagatti	10,728	....	209, dated 23rd May 1887.	402, dated 31st May 1887.
10 Ubrani	11,940	....	308, dated 28th July 1903.	841, dated 4th August 1903.
11 Woddapatti	17,720·5	B.P. No. 691, dated 15th December 1887.	371, dated 22nd November 1887. 325, dated 19th November 1941.	959, dated 6th December 1887. 1381, dated 25th November 1941.
		Denkanikota West Range.		
1 Sanamavu	4,794	....	70, dated 3rd February 1903.	159 and 160, dated 10th February 1903.
2 Sanamavu Extension.	9	B.P. No. 91, dated 18th April 1913.	161, dated 27th March 1913.	399, dated 15th April 1913.
3 Noganur	3,402	....	182, dated 29th June 1888.	....
4 Thalli	8,160	....	255, dated 7th July 1887.	532 and 533, dated 12th July 1887.
5 Thalli Extension	3,168	....	547, dated 25th November 1892. 199, dated 23rd April 1898.	1513, dated 29th November 1892. 2249 and 2250, dated 24th November 1925.
6 Pane	17,387	....	290, dated 11th June 1901.	1081 to 1085, dated 11th June 1901.
7 Javalagiri	7,763	B.P. No. 523, dated 14th August 1887.	305, dated 23rd February 1887.	679, dated 23rd August 1887.
8 Hulibanda	8,010	....	242, dated 24th April 1907.	507 and 508, dated 21st May 1907.
		Denkanikota East Range.		
1 Denkanikota	2,936	....	335, dated 31st August 1887.	768, dated 27th September 1887.
2 Denkanikota Extension.	980	G.O. No. 2020, dated 3rd November 1919.	447, dated 3rd November 1819.	....
3 Aiyur	6,892	B.P. No. 158, dated 19th March 1887.	120, dated 5th August 1887.	202, dated 8th August 1887.
4 Aiyur Extension I ..	3,922	G.O. No. 2020, dated 3rd November 1910.	449, dated 3rd November 1910.	....
5 Aiyur Extension II ..	325	....	179, dated 10th May 1929.	1019 and 1020, dated 28th May 1929.
6 Aiyur Extension III.	140	....	280, dated 16th August 1935.	1184, dated 27th August 1935.
7 Gulhatti	8,028	B.P. No. 565, dated 1st October 1887.	318, dated 9th September 1887.	733, dated 13th September 1887.
8 Nayanasandiram Agraharam.	424	....	222, dated 2nd May 1906.	499, dated 8th May 1906.
9 Tholuvabetta ..	8,109	....	204, dated 20th May 1887.	381, dated 25th May 1887.
10 Tholuvabetta Extension.	1,168	....	113, dated 10th March 1906.	306 and 307, dated 13th March 1906.
		Dharmapuri Range.		
1 Thoppur	9,801	B.P. No. 183, dated 12th April 1892.	40, dated 12th April 1892.	328, dated 22nd April 1892.
2 Parigam A	3,460	B.P. No. 407, dated 1st October 1900.	76, dated 1st October 1900.	1370 and 1371, dated 11th September 1900.
3 Parigam B	12,167	....	Do.	Do.
4 Sigarahalli Parapadipatti.	2·05	....	61, dated 10th September 1895.	1025, dated 10th September 1895.
5 Morappur	19,314	B.P. No. 580, dated 30th October 1888.	289, dated 24th September 1888.	739 and 740, dated 9th October 1888.
6 Keserguli	8,132	....	300, dated 22nd June 1892.	831, dated 28th June 1892.
7 Keserguli Extension.	110	G.O. No. 3632, dated 16th November 1917.	500, dated 16th November 1917.	1357, dated 4th December 1917.
8 Pikkilimalai	5,469	....	261, dated 30th May 1892.	746, dated 14th June 1892.

Serial number and name of the reserved forest.	Area in acres.	Reference to authority communicating section 16 notification.	Section 16 notification number and date.	Page in "Fort St. George Gazette."
(1)	(2)	(3)	(4)	(5)
		Krishnagiri Range.		
1 Hudedurgam ..	2,816	G.O. No. 2020, dated 3rd November 1919, G.O. No. 703, dated 12th May 1925, and B.P. No. 1751, dated 5th August 1926.	44, dated 3rd November 1919.	1453 to 1459, dated 9th December 1919.
2 Varatanapalli ..	2,032	....	262, dated 10th May 1893.	591, dated 30th May 1893.
3 Varatanapalli Extension.	..	....	261, dated 15th September 1922.	1000, dated 19th September 1922.
4 Togarapalle	900	B.P. No. 642, dated 15th November 1887.	359, dated 25th October 1887.	836, dated 25th October 1887.
5 Tattakallu	857	....	238, dated 1st May 1893.	517, dated 9th May 1893.

Section 7—State of the Boundaries.

17. The boundaries of the reserved forests are demarcated by cleared lines usually 18 feet wide along which are set rough stone cairns at salient angles and intermediate points. On account, however, of the persistent encroachment by *Lantana*, the effective cleared width of the reserve lines is often less than 18 feet. The cleared line is especially narrow in places in the Denkanikota, Tholuvabetta, Sameri and Kempakarai reserves in Denkanikota East Range, in the Pane, Noganur and Javalagiri reserves in Denkanikota West Range, in the Urigam reserve in Anchetti range and in the Marandahalli reserve in Dhamapuri range. On the whole, the state of the boundaries is satisfactory.

18. All the reserves are reported to have been permanently demarcated.

19. *The Mysore Frontier.*—The Mysore-Salem frontier line goes with boundary line of the reserved forests for an aggregate length of 38½ miles. In 1914–15 the boundary lines to an aggregate length of 13 miles were inspected. In 1915 and 1916, Mr. H. A. Latham made a detailed investigation of the boundaries adjoining the Thalli and Javalagiri reserves and drew attention to several discrepancies and obscurities in the provincial frontier lines. In its Resolution No. 271, dated 15th October 1915, the Board agreed with the Collector "that a fresh survey of the Hosur-Mysore boundary is necessary where it runs through jungle." In its Resolution No. 281, dated 22nd October 1915, the Board of Revenue classified the Hosur-Mysore frontier as a long boundary, the inspection and check of which was to be spread over three years, a third being gone over every year, but directed that, till the line was surveyed afresh as proposed, the portion of it running through jungles need not be inspected. In 1928 on account of the uncertainty of the boundary, a dispute arose between the Madras and Mysore Forest Departments in regard to the ownership of sandal trees in an area adjoining the Javalagiri reserve, which was claimed to be in the Mysore State forests. Although at first unwilling to agree to a fresh survey of the boundary, the Mysore Government eventually agreed to participate in a joint verification of the boundary on the joint recommendation of the District Forest Officer of North Salem and Bangalore. The discrepancy which extended over a length of 2,574 links was settled eventually in 1936 by the Madras Survey Party and which was acquiesced in by representative of the Mysore State. This settlement was subsequently approved by the Madras Government.

Section 8—Legal Position.

20. The reserved forests of the division are the absolute property of the State, subject to the exercise by the people of certain rights and concessions recognized at the time of settlement.

At the time of reservation of the Ubrani reserve, the Ubrani agraharam, 1,600 acres in extent, which was 'thrishvakam' village was included in the reserve. The agraharamdars are entitled to and receive a share of the net revenue from the reserve.

Section 9—Rights and Concessions.

21. The rights and concessions recognized at the settlement are detailed in section 16 notification relating to each reserve. References to the date of issue and the pages in which the notifications were published in the *Fort St. George Gazette* are given in the statement of reserved forests under paragraph 16.

CHAPTER II—THE FOREST.

SECTION 1—COMPOSITION AND CONDITION OF THE CROP.

22. *General.*—The forests dealt with in this plan are, in the main, an associate formation composed of a great wealth of deciduous species with a thorny undergrowth. The trees do not generally attain to any great size, being dwarfed by a variety of unfavourable factors, the chief of which is a scanty rainfall. Apart from the size of the trees, a large majority of the species occurring in the forest are intrinsically of no commercial value, except as firewood. But for the abundant occurrence of sandal and of bamboo over a large part of the division, the forest would be economically unimportant. The sandal and the bamboo are, roughly speaking, confined to the Hosur plateau, and elsewhere, to the slopes of hills with elevations over 2,500 feet. At lower elevations, the forest is usually a deciduous scrub fit only for fuel. An important exception to this exists on the slopes falling to the Cauvery and the Chinnar near Muthur. These slopes carry extensive gregarious and often almost pure stands of *Hardwickia binata,* a timber species of great potential value. Except for *Hardwickia binata*, timber as it is ordinarily understood is not available in the division in commercial quantities, although a sprinkling of recognized timber species such as teak *Pterocarpus marsupium* and *Dalbergia latifolia* is found in several parts of the forest.

23. While it is generally true that the factors of the locality are not such as to favour luxuriance of growth in the forest, its present condition is in part due to the influence of man. The tract was the scene of very considerable activity in the eighteenth century. The numerous sites of deserted villages that are met with in most of the reserves point to the fact that these areas were once far more populous than they are to-day. Especially is this true of extensive areas adjoining the Cauvery near Hogainakal and along the Chinnar in in the Morappur valley. There existed till 1802 a taluk of Alambadi (which is now an abandoned village site on the right bank of the Cauvery in Kollegal Division) and a part of this taluk on the left bank of the Cauvery was among the the territories ceded to the East India Company by the Treaty of 1799. "At Kolimur, not far from Anchetti, are the remains of a slag mound, the relic of a long extinct iron-smelting industry. The whole area is intersected with a net-work of roughly paved cause-ways, which still affored means of communication from village to village. The reserved forest enshroud many inam villages, long since forgotten and uncared for . . . . . There is little doubt that regular trade-routes existed in the eighteenth century between the Balaghat and the low lands, by way of the Kaveri valley, and that the commissariat requirements of both Tippu and the British were a heavy drain on the resources of the villagers, who tenanted the adjoining tracts . . . . . The Great Famine of 1877–78 led to the complete desertion of many villages and forest reservation followed before the ryots could reclaim their lands. Hence it is that many square miles of cultivated land have in the course of a century lapsed into jungle." (Gazatteer of the Salem District, Volume I, Part II, pages 109, 110.) "As was the case in Hosur taluk, so also in Dharmapuri, the western portion of the taluk which adjoins the Kaveri has lapsed from its former prosperity, and is now throttled with jungle. A considerable area of the hill country north of the Palakodu-Pennagaram road, including the Pikkili Hills and the Morappur valley, was formerly within the limits of Hosur taluk, and at the time of cession formed part of the old Alambadi taluk. The tract was at one time well populated, and the maps prepared at the Forest Survey show innumerable deserted village sites. No less than 28 *paimash* villages are entirely covered with forest reserves . . . . . The English Inam Register tells a similar story. Under Mysore rule large areas of cultivable land, now smothered in reserved forests, were granted as inam to Brahmans. For instance, in the Baiyanur Reserve there was an agraharam village, with nine hamlets, which in the Survey of Fasli 1219 (1809–10), was found to cover 3,400 acres inclusive of several minor personal inams. The agraharam was granted by Dodda Krishna Raja of Mysore (1714–31 A.D.) to one of his ministers, who divided the village into twelve *vridhis* or shares. In 1865, at the Inam Settlement, the village is described as 'in the midst of jungle and inaccessible rocks'; the soil is poor, the village thinly populated, the place is infested with elephants and tigers. Hence the low state of cultivation and the low *beriz.* The inamdar's interest was finally bought in by Government for a nominal sum, and the village lapsed into reserved forest. Many other rent-free hereditary *Shrotriyams,* granted as charity to Brahmans for subsistence, suffered a similar fate. Sorry enough gifts would these patches of jungle be in their present conditions ; yet Dodda Krishna Raja and other royal patrons who preceded him, were not in the habit of insulting the Brahman hierarchy with empty charities, and it is clear that landed property in these Kaveri-side forests was at one time worth having " (Gazetteer of the Salem District, Volume I, Part II, pages 190 and 191).

24. It would appear therefore that the existing forest on a considerable area of the Cauvery slopes and in the Morappur valley is of comparatively recent origin, dating back to not much more than a hundred years ago. And if the same is not strictly true of the forest on the Hosur plateau, it is, at any rate, very probable that the greater part of it too

is young, being regrowth from the fellings that must have been made during the period of military activity in the eighteenth century. The reason for the absence of trees of great age of size is thus plain ; even if the soil and climate had been more favourable than they are, the forest has not had the time to produce any big timber. Forest protection has been in force far too short a period for its effect on the growing stock to become strikingly apparent.

25. Among the many adverse factors which tend to degrade the crop may be mentioned the twin evils of overgrazing and fire, evils which are probably as old as the forest itself. In recent years a new factor, fraught with the gravest menace to the crop has appeared in the forest, in the shape of Lantana. This peril is described at some length in a later paragraph.

26. As already noted, the division is essentially a plateau, falling to the Cauvery valley in the south and to the Krishnagiri-Dharmapuri plain on the east. In its fall to the Cauvery, the ground achieves its greatest descent, about 2,000 feet. The intermediate Anchetti-Pennagaram plateau (1,800 feet elevation) is a well marked stage in this descent. Thus the forest may be broadly divided into the following regional types, in which the basis of differentiation lies in the respective elevation of the tracts. The variations in the soil and rainfall within the limits of the division though undoubtedly influencing the nature of the crop, are not wide enough to account for the marked floristic diversity in the regional types. This diversity is rather to be ascribed to the differences in elevation, than to variations in soil or rainfall. The following regional types may be distinguished :—

(1) The Hosur plateau, with an elevation ranging from 2,500 to 4,000 feet. This region comprises the whole of the two Denkanikota ranges, the portion of Dharmapuri range lying on what is known as the Molagiris and a small portion of Anchetti range lying on the Urigam-Ubrani slopes. It is the most valuable tract in the division, as it includes practically all the sandal areas and a great proportion of the bamboo areas. It constitutes, in short, the optimum habitat of sandal and of bamboo.

(2) The intermediate plateau ranging in elevation from 1,500 to 2,500 feet. This region includes the Anchetti, Natrapalayam and Pennagaram plateau, as well as the Morappur valley. Sandal is intrusive into this type. Except for this fact and a certain amount of bamboo, the forests of this region are of no great commercial significance and may be classed as fuel and small timber jungle.

(3) The Cauvery slopes, ranging in elevation from 800 to 1,500 feet. This region includes not only all the slopes falling to the Cauvery, but also similar slopes falling to the Chinnar river and the Anaibidda Halla. The forest contains a high proportion of gregarious *Hardwickia binata.*

(4) Thoppur Ghat with an elevation of less than 1,000 feet except for few peaks, reaching above 2,000 feet is continuation of the plateau forests towards the south. These reserves mainly consist of low-lying hills and valleys containing a mixed deciduous type of forests, the hill slopes being clad with tree growth. *Chloroxylon swietenea*, *Albizzia amara*, and *Acacia sundra* are the predominent species commonly met. *Hardwickia* binata is found in Badanavadi reserve.

27. The above description will have given a general picture of the forests. A more detailed account of it will be given under the following specific types :—

(1) The sandal type ; (2) the bamboo type ; (3) the Shorea talura type ; (4) the *Hardwickia* binata type ; (5) the superior deciduous type ; (6) the shola type, and (7) the inferior deciduous type.

28. *The sandal type.*—The aggregate sandal area in the reserve forests of the division is 84,877 acres, and is distributed as follows in the five ranges :—

	ACS.
Denkanikota, East	23,307
Denkanikota, West	34,830
Dharmapuri	8,817
Anchetti	8,470
Krishnagiri	9,453

The Hosur plateau, on which the whole of the two Denkanikota ranges, a great part of the Dharmapuri range and a portion of Anchetti range lie, is both historically and in actual content the most important sandal tract. This plateau, together with the Mysore plateau of which indeed it is a part, was perhaps the earliest Indian home of sandal. The conditions on the plateau, both physical and floristic, are those commonly regarded as the optimum for sandal ; the elevation ranges between 2,500 and 4,000 feet ; the terrain is a rolling tableland rising to low hills with moderate slopes ; the temperature ranges between 50° and 90° ; the rainfall is adequate without being excessive ; the flora is a deciduous thorny scrub. Sandal was widespread in this region. There are, however, large areas where the species is either absent or very poorly represented, such as, for instance, parts of the Sanamavu and Hudedurgam reserves.

29. The species commonly associated with sandal are—

(1) *Memecylon edule.*
(2) *Memecylon gracile.*
(3) *Erythroxylon monogynum.*
(4) *Chloroxylon swietenia.*
(5) *Zizyphus xylopyra.*
(6) *Zizyphus jujuba.*
(7) *Canthium didymum.*
(8) *Albizzia amara.*
(9) *Diospyros montana.*
(10) *Pittosporum floribundum.*
(11) *Wrightia spp.*
(12) *Bauhinia racemosa.*
(13) *Ferronea elephantum.*
(14) *Acacia leucopholea.*
(15) *Limonia acidissima.*
(16) *Eleodendron serratum.*
(17) *Eleodendron glaucum.*
(18) *Atalantia monophylla.*
(19) *Ixora parviflora.*
(20) *Pongamia glabra.*
(21) *Diospyros melanoxylon.*
(22) *Strychnos nuxvomica.*
(23) *Strychnos potatorum.*
(24) *Cassia fistula.*
(25) *Sapindus emarginatus.*
(26) *Dichrostachys cinerea.*
(27) *Buchanania latifolia.*
(28) *Givotia rottleriforms.*
(29) *Balsamodendron berryii.*
(30) *Butea frondosa.*
(31) *Semecarpus anacardium.*
(32) *Olea dioica.*
(33) *Terminalia paniculata.*
(34) *Terminalia tomentosa.*
(35) *Phylanthus emblica.*
(36) *Tectona grandis.*
(37) *Bambusa arundinacea.*
(38) *Toddlia ascitica.*
(39) *Dendrocalamus strictus.*
(40) *Mandolia suberosa.*

30. *Condition of the sandal crop.*—Notwithstanding the favourable conditions referred to above, the condition of the sandal growing stock is bad both as regards quality and quantity. Spike disease appeared in this division as late as 1913, the initial points of attack being the Javalagiri reserve, where its incidence was from the beginning of an epidemic character, and scattered localities in the Thalli, Aiyur and Tholavubetta reserves. The disease has since spread to most of the sandal areas on the Hosur plateau. The alarming feature of the disease is, however, not that it has spread widely—its spread was inevitable—but that everywhere it persists with epidemic virulence. The case of the Javalagiri reserve of which Mr. Wilson wrote in 1917 that it was the densest sandal area in the division, is typical of the degradation caused by persistent epidemic spike. Since 1917 this reserve has produced no less than 900 tons, representing an aggregate number of over three lakhs of trees extracted over an area of less than 8,000 acres. About 430 tons of sandalwood was extracted from the same reserve during the period from 1935–36 to 1944–45. Though the average quantity of sandalwood extracted per year both from 1917 to 1932 and from 1936 to 1945 was about the same number of trees extracted was almost twice as many as those extracted from 1917 to 1935. The following table shows the number of sapwood trees extracted during the five years ended 1939–40 :—

Range.	1935–36.	1936–37.	1937–38.	1938–39.	1939–40.
Dharmapuri and Krishnagiri	649	2,363	481	2,925	703
Denkanikota West	18,641	14,097	11,381	7,980	9,643
Denkanikota East	14,595	14,194	21,042	18,683	20,315
Anchetti	305	586	245	241	1,154
Total ..	34,190	21,240	33,149	29,729	32,815

The mortality of the sandalwood saplings was greater than what it was before Mr. Ranganathan's Working Plan came into force ; from one-third area of the Sandal Working Circle of the division 34,573 trees out of 94,439 trees extracted in 1936–37 contained no heartwood. It was ordered by the Chief Conservator of Forests in 1941 that, as a trial measure for one year, not to enumerate sapwood trees for extraction, in the Denkanikota West Range and in any of the subsequent year's coupes in which it was then too late to revert to the old system of enumeration without undue waste of time and money. (Chief Conservator's L. Dis. No. 54/41, dated 28th December 1940 and 7th January 1941.)

31. The Javalagiri reserve is now one mass of dense lantana. There is in consequence, a great paucity of suitable hosts for the sandal, the lantana itself being a good nurse but a very bad host. Large numbers of sandal saplings which have raised their heads above the protective bush have been attacked by spike. The reserve has suffered a stupendous drain from the effects of which it seems unlikely that it will recover, so long as the lantana is allowed to persist. Nor is the Javalagiri reserve a unique case. The process of deterioration is visibly taking place before our eyes at many points of the division. In the Nymasandiram Agraharam, Noganur and Denkanikota reserves the degradation is almost complete; the Aiyur and Gulhatti reserves are plainly going the way of Javalagiri reserve.

Except in Manchi and Tholavubetta reserves, which still contain a sprinkling of bigger girth class and mature trees, the entire sandal tract is rapidly turning into an immature crop of trees of small girth classes mostly having only sapwood, badly attacked by spike in its seedling or sapling stages.

32. *Natural regeneration of sandal.*—The natural regeneration of sandal is generally adequate and especially profuse in lantana areas.

33. *The bamboo type.*—The aggregate area of bamboo forest in the] reserves of the division is 66,720 acres and is distributed in the five ranges as follows :—

	ACS.
Denkanikota, East	17,988
Denkanikota, West	19,566
Dharmapuri	9,224
Anchetti	11,865
Krishnagiri	8,077

Two species of bamboo are met with, namely, *Dendrocalamus strictus* and *Bambusa arundinacea*, but the former is by far the commer of the two. The *Bambusa* is confined to stream banks, swamps and flattish moist regions and, except in the Sameri reserve and parts of the Tholavubetta valley where it occurs gregariously over considerable areas, it is usually found in small patches. The *Dendrocalamus* occurs extensively on slopes ranging in elevation between 2,000 and 3,500 feet, often forming gregarious stands of pure bamboo. The quality of the bamboos found in this division, especially of the *Dendrocalamus*, is generally poor, the culms being small sized. In spite of the thinness of the *Dendrocalamus* culms, they are usually hollow ; the solid variety does not occur in this division.

34. The species associated with the bamboo are generally the same as those found in the sandal type—

1 *Santalum album.*
2 *Anogeissus latifolia.*
3 *Grewia tiliaefolia.*
4 *Chloroxylon swietenia.*
5 *Albizzia amara.*
6 *Dalbergia latifolia.*
7 *Tectona grandis.*
8 *Terminalias.*
9 *Wrightia spp.*
10 *Canthium didymum.*
11 *Chloroxylon swietenia.*

35. *The Shorea talura type.*—Numerous small patches (over 190 in number) of *Shorea talura* forest, aggregating to a total area of 3,255 acres, are found dotted here and there in the forests of the Hosur plateau. All the *Shorea* patches are not shown on the stockmaps. The species tends to occur gregariously, but pure extensive stands of *Shorea* are uncommon in this division. The patches are of limited size, rarely over 50 acres in extent. The most important of these patches occur in the Thalli, Javalagiri and Tholavubetta reserves, but groups of trees are also to be found in the Aiyur, Denkanikota, Pane, Hulibanda, Marandahalli and Guttiroyan reserves. The species is confined to elevations over 3,000 feet, and favours either steep slopes or broken country much subject to gully erosion where the soil contains a high proportion of kaolin. The timber is as a rule stunted and misshapen and is as such of little value. The species is, however, a good host for the lac insect and the trees are being used for lac cultivation on an experimental scale. Natural regeneration of *Shorea* is generally adequate. Heavy mortality to the trees is caused by a Longicorn borer named *Hoplocerambyx spinicornis*. On account of the resinous nature of the trees and the presence of large numbers of dead trees killed by the borer, much damage is caused by fire when it breaks out in *Shorea* areas.

36. *The Hardwickia binata type.*—The total area of forest containing appreciable quantities of *Hardwickia binata* in the division is 59,716 acres. The following statement shows its distribution in the several reserves :—

Name of range.	*Name of reserve.*	*Area of reserve.*	*Effective Acha area in acres.*
		ACS.	
Dharmapuri	Baiyanur Malai and Extensions ..	14,020	4,731
	Wodapatti	18,053	11,209
	Guttirayan	14,682	4,306
	Badanavadi and Extension	28,103	2,000
	Total	74,858	22,246
Anchetti	Anchetti	9,554	317
	Ubrani	11,940	446
	Taggati	10,728	3,120
	Urigam	7,984	95
	Bilikal	13,426	2,915
	Biligundlu	15,054	7,105
	Natrapalayam	12,323	7,330
	Mallahalli	9,964	6,258
	Kestur and Extension	20,824	9,884
	Total ..	111,797	37,470

This species occurs gregariously often in complete possession of the ground, on slopes draining to the Cauvery, the Chinnar and the Anaibidda Halla. It is thus distributed in a more or less compact block, ranging in elevation between 900 and 1,500 feet. *Hardwickia* is also occasionally met with at higher elevations, but in such localities it forms a small proportion of the growing stock and is evidently unable to gain ground against the competing species, the regeneration being markedly deficient. Between the height limits indicated above, it is clearly the dominant species, and the species best adapted to the prevailing conditions. The gregarious and universal occurrence of *Hardwickia binata* within the limits indicated above is a striking phenomenon which is not in our view to be attributed solely to the high temperatures and low rainfall characteristic of the habitat of the species. The climatic factor, though important, cannot directly account for the manner in which *Hardwickia* is rapidly gaining ground at the expense of species which are themselves at home in hot dry localities. It is believed that the factor that favours the spread of *Hardwickia* is an extraneous circumstance, namely, the regular occurrence of fires which progressively destroy the less fire-hardy species and leave a clear field for *Hardwickia* and for *Anogeissus Chloroxylon*, and *Boswellia* which are its commonest associates. In its earliest years, the *Hardwickia* seedling apparently makes very little top growth, its energies being absorbed in entrenching itself in the ground and in developing a good root system. The annual ground fires are thus unable to kill the seedling. When an adequate root system has been developed, the plant shoots up in one year above the surrounding grass and thereafter is hardly affected by the fires. The heavy periodical seed years enable the species to invade new areas gregariously. It is surely significant that the best *Hardwickia* areas are to be found on slopes in the neighbourhood of perennial sources of water, such as the Cauvery, that is in regions subjected to heavy grazing for about eight months in the year and burnt annually in the grazing interest. Grazing then would appear to play an important in determining the distribution of the species.

37. A large proportion of the *Hardwickia* type of forest seems to be of comparatively recent origin ; the growing stock is generally young, although big gnarled trees, presumably of great age, are to be found in most parts of the forest. It has already been noted that the comparative youth of the *Hardwickia* forests is probably due to the fact that the Cauvery region was once more populous than it is to-day and that in consequence the forests themselves are new. The species associated with *Hardwickia* are—

1 *Chloroxylon swietenia.*
2 *Albizzia amara.*
3 *Anogeissus latifolia.*
4 *Boswellia serrata.*
5 *Sapindus emarginatus.*
6 *Dichrostachys cinerea.*
7 *Acacia sundra.*
8 *Diospyros spp.*

38. *The Superior deciduous type.*—Although the division as a whole is deficient in timber species other than *Hardwickia binata*, there are several patches of forest where valuable species such as teak, *Pterocarpus marsupium*, *Dalbergia latifolia* and *Terminalia tomentosa* occur in some profusion. These patches are, however, of limited size and the tree growth in them is generally stunted. The superior deciduous type of forest may be distinguished in parts of the Manchi, Tholavubetta, Kempakarai, Bilikal, Guttirayan, Hulibanda and Taggati reserves.

39. *The shola type.*—At the foot of the Guttirayan drug, in the Guttirayan reserve, there is a small patch of shola forest, about 360 acres in extent, in the midst of which is a dark, perennial pool of water. This shola, which lies at an elevation of 4,150 feet, is of climatalogical value, but is commercially unimportant. The following species occur in the shola :—

1 *Memecylon spp.*
2 *Mimusops spp.*
3 *Eugenia spp.*
4 *Alseodaphne semecarpifolia.*
5 *Diospyros spp.*
6 *Lissaea spp.*
7 *Pleurostylia wightii.*
8 *Artabotrys odoratissimus.*
9 *Alphonesa salerocarpa.*

Mention may here be made of numerous patches, of varying size, of a semi-evergreen type of vegetation, which are found dotted about various parts of the Hosuer plateau. The main species composing this type are *Memecylon edule*, *Memecylon gracile*, *Ardesia*, and *Litsaea*. Typical patches of the semi-evergreen type are to be found in the Aiyur, Galigattam and Sameri reserves, in the unreserves around Siddapuram and Kodagerai and in the Guttirayan reserve above Bidamarathupatti. These must be regarded as climatic forests and their conservation is of importance in order to safeguard the water-supply of the plateau.

40. *The inferior deciduous type.*—The remainder of the forest may be broadly described as a thorny inferior deciduous scrub composed of the usual variety of species. The forest is very open, being often a series of bushes interspersed with extensive blanks and the tree growth is as a rule stunted and misshapen. It seems unlikely that any improvement

either in quality or in density will ever result in this type of forest even given the strictest protection, except through intensive artificial regeneration. In localities where outcrops of kankar (limestone nodules) occur, *Acacia sundra*, *Dichrostachys cinerea* and *Dodonea viscosa* take possession of the ground to the exclusion of other species. Along stream banks, especially at lower elevations, large trees of Terminalia arjuna and mango may be found. The more important species found in this type of forest are listed below :—

1 *Albizzia amara.*
2 *Chloroxylon swietenia.*
3 *Acacia sundra.*
4 *Dichrostachys cinerea.*
5 *Wrightia tinctoria.*
6 *Memecylon edule.*
7 *Zizyphus spp.*
8 *Canthium didymum.*
9 *Bauhinia spp.*
10 *Diospyros spp.*
11 *Albizzia lebbeck.*
12 *Feronia elephantum.*
13 *Givotia rottleriforms.*
14 *Atalantia monophylla.*
15 *Grewia spp.*
16 *Ixora parviflora.*
17 *Holoptelea intergrifolia.*
18 *Butea frondosa.*
19 *Strychnos spp.*
20 *Erythroxylon monogynum.*
21 *Premna tomentosa.*
22 *Acacia leucophloea.*
23 *Pittosporum floribundum.*
24 *Gmelina spp.*
25 *Balsamodendron berryii.*
26 *Protium caudatum.*

SECTION 2—INJURIES TO WHICH THE CROP IS LIABLE.

41. The most serious injuries to the crop are those caused by man, animals, plants, fire and by disease, especially spike so far as sandalwood is concerned.

(i) *Injuries caused by man.*

42. *Theft.*—Theft of forest produce, especially of firewood, is rife in various parts of the forest, chiefly in the neighbourhood of big village such as Denkanikota, Kelmangalam, Pennagaram and Krishnagiri. A class of people, usually belonging to the depressed classes, are dependent on the trade in stolen firewood for their livelihood. This illicit traffic has the effect of depressing the demand for legitimate fuel coupes. As the theft of firewood generally takes place from the same easily accessible parts of the forest, these areas undergo a steady deterioration. The following statement shows the number and nature of forest offences detected during the past three years :—

Locality.	*Year.*	*Injury to forest by fire.*	*Unauthorized felling or appropriation of wood and minor forest produce.*	*Grazing without permission or in tracts in which grazing is prohobited.*	*Other sources.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Reserve	1944–1945 ..	..	510	120	90	720
Unreserve	1944–1945 ..	..	180	..	3	183
Reserve	1945–1946 ..	..	722	171	37	930
Unreserve	1945–1946 ..	..	214	..	5	219
Reserve	1946–1947 ..	..	740	126	32	895
Unreserve	1946–1947 ..	..	87	..	..	87
			2,453	417	167	3,034

43. *Fire.*—The most serious injury caused to the forest by man is through fire. Fires are of annual occurrence on the Cauvery slopes. The Hosur plateau is undulating and fairly well wooded and one would not normally expect widespread fires in this locality. The points of difference between fires on the plateau and those on the Cauvery slopes are summarised in the following table :—

Hosur plateau.	*Cauvery slopes.*
(1) Fire is caused by burning lantana and bamboo and easily tends to become a terribly destructive *crown fire.*	Fire is caused by burning grass and is generally a *ground fire.*
(2) The vegetation, especially sandal, is not used to fire, is not fire-resistant and is completely destroyed.	The flora represents the surviving species after a vast number of fires ; it consists of fire-hardy species whose regeneration is sometimes actually promoted by fire, e.g., *Hardwickia binata.*
(3) No one has any interest in causing the fires, or derives any advantage from them except, perhaps, to clear footpaths. It is now generally known that fire helps, instead of killing, lantana.	Fires are caused by graziers who are thus a class of people with a permanent interest in burning the forest.

(ii) *Injuries caused by animals.*

44. Rats, squirrels and other vermin eat the seeds of sandal and probably reduce the chances of natural regeneration. A certain amount of damage to sandal trees is caused by deer and a sambhur rubbing themselves against the bark. Monkeys cause considerable loss by eating the fruits of tamarind.

Grazing.—The forests of the division are intensively grazed, over the number of cattle licensed to graze annually being in the neighbourhood of 113,000. The familiar evils of excessive grazing such as the hardening of the surface soil, the consequent poverty of natural regeneration, the destruction of tender seedlings by cattle, are noticeable in all parts of the forest. The invasion of lantana has been followed by a series of terribly destructive fires, and though the lantana favoured profuse reproduction of sandal, this was really a disadvantage as the successive fires had denuded the area of most of the hosts. On the Cauvery slopes the incidence of grazing is at its heaviest and has therefore materially influenced the character of the forest. These areas are fired annually, presumably by graziers, for the sake of the tender grass which springs up with the first rains after a burn and the prevention of the fires so long as grazing continues to be permitted appears to be a practical impossibility.

(iii) *Injuries caused by insects.*

45. A longieon borer *Hoplocerambyx spinicomis,* causes much mortality to *Shorea talura* trees.

The research sections at Denkanikota has now come to a tentative conclusion that '*Jassus indicus*' is the transmitter of the spike virus.

(iv) *Injuries caused by plants.*

46. Sandal trees are often found to be infested with climbers, such as *Pterolobium indicum, Asparagus racemosa, Secamone emetica* and lantana. Sandal appears to be particularly prone to infestation by climbers and needs to be regularly tended in order to counteract this evil. Being a root-parasite coming up in close proximity to its hosts sandal suffers much from suppression and requires to be freed by frequent tending.

47. *Lantana.*—The alarming spread of this noxious pest in recent years has perhaps caused more serious damage to the forest than all the other factors put together. A disquieting feature is that the optimum habitat of lantana is the same as that of sandal and that its spread has taken place largely on the Hosur plateau. Le Fanu, who wrote the Salem District Manual in 1883, does not mention lantana in his rather full description of the Siddapuram plateau, an area where lantana is now impenetrably entrenched. During the World War I, hay used to be made around Aiyur. There is now little besides lantana in the undergrowth of these forests. It is perhaps safe to assume that this pest appeared in North Salem in the early years of this century. It has been suggested that the reason for the enormous spread of lantana lies in the death of bamboos and the consequent opening of the canopy.

48. The evils of lantana are briefly considered below :—

(1) It takes possession of the ground in gregarious, tangled masses, choking all regeneration including its own, except only that of sandal. It is a good nurse for sandal, but a very bad host.

(2) Its intimate connexion with the rapid spread and persistent virulence of spike has already been considered.

(3) It progressively eliminates all other species in the area, except *Acacia leucophloea,* sandal and bamboos. The large numbers of sandal seedlings which come up under its shade are thus starved of suitable hosts.

(4) It is said to render the soil toxic to other plants.

(5) It drives out all game, including birds, from its midst.

(6) It destroys all grass.

(7) When fire breaks out in lantana areas, it easily becomes crown fire and destroys all vegetation. The lantana comes up readily again, but not so the other species. The forest thus undergoes a repeated process of deterioration.

(8) It is itself useless for any purpose, although the poorer classes burn it as firewood. This, however, it not by choice, but by desperate need.

49. It is evident that lantana is the enemy not only of sandal but of the forest as a whole. In magnitude, complexity and peril, the problem of lantana dwarfs even that of spike which is dealt with below.

(v) *Injuries caused by disease.*

50. *Spike disease of sandal.*—The general history of the discovery of spike in sandal, its disastrous spread to practically all sandal tracts in South India, its symptoms and its invariably fatal character are now well known to forest officers and it is unnecessary to

deal with these matters in this report. This disease was first observed in North Salem in 1913 by Mr. McCarthy in the Javalagiri reserve. By the time Mr. C. C. Wilson took up the preparation of the Hosur Sandalwood Working Plan in 1915, the disease had spread to the whole of the reserve where it raged with epidemic virulence and the reserve was in consequence excluded from the purview of the working plan. Mr. Wilson noticed the disease in isolated areas in the Aiyur and Tholavubetta reserves. But so slight was the incidence outside the Javalagiri reserve and so little was its subsequent disastrous spread anticipated, that the working plan disregarded the disease. There seems to be little doubt that the disease first came into North Salem from the adjoining Mysore territory. Notwithstanding its delayed advent (the disease has appeared several years earlier in North Coimbatore and Kollegal) it spread with great rapidity and in the short space of twenty years has attacked almost all the sandal reserves on the Hosur plateau. The following statement shows the names of the reserves attacked and the years in which the first attacks were noticed :—

Name of reserve.	*Year of first attack.*	*Name of reserve.*	*Year of first attack.*
Javalagiri	1913	Manchi	1915
Thalli	1915	Kempakarai	1926
Kulibanda	1923	Marandahalli	1919
Pane	1924	Galigattam	1919
Naganur	1921	Guttirayan	1928
Denkanikota	1926	Urigam	1926
Aiyur	1917	Hudedurgam	1939
Nyamasandiram	1924	Keserguli	1937
Tholavubetta	1915	Korappur	1937
Gulhatti	1915		

51. Reference has already been made to the persistence of the disease in an epidemic condition in all areas invaded by it and the consequent progressive degradation of the sandal growing stock. It has also been shown that so far, at any rate, as keeping the disease incidence within reasonable bounds and allowing the growing stock to hold its own by the process of natural selection is concerned, the problem of spike is closely bound up with that of lantana.

52. In spite of our long familiarity with the disease and continued research into its nature, the final solution of the problem is not yet in sight. Indeed there are workers who still maintain that spike is not a disease at all but only a pathological condition induced by a number of adverse factors. But the investigations of Dr. Coleman and of the Indian Institute of Science have established beyond all reasonable doubt that spike is of the nature of a virus disease which is infectious and which can be artificially transmitted.

53. Organized investigations, subsidized by the Government of Madras, were undertaken by the Indian Institute of Science in October 1927 and were continued till the end of 1933. The problem was examined in its biochemical, entomological and silvicultural aspects, the biochemical work being done in the laboratories of the institute, the entomological work being carried out by the Forest Research Institute which collaborated in the enquiry, and the field observations and experiments being carried out by the District Forest Officer, North Salem, assisted by a special ranger. The interesting results of the work done by the Indian Institute of Science and the Forest Research Institute have been published in their respective publications. A brief account of the results of the field investigations undertaken in North Salem both before and after 1927 is given below.* The conclusions derived from the field experiments are generally of a negative character and must be regarded as tentative. In the following account the method adopted is to state the conclusion and then adduce the experimental evidence on which it rests :—

(*a*) Drought cannot, by itself, be considered the cause of spike.

Evidence.—(1) Six spiked saplings and six healthy saplings were kept regularly watered once a week from 25th October 1925 to August 1927. All the spiked plants were dead by the middle of February 1928. In October 1927, three of the healthy plants got spiked.

(2) In the Denkanikota reserve, spike started in the delta of a tank where the soil is a deep sandy loam, retaining plenty of moisture. The whole of this delta area got spiked by October 1931 and the disease is since spreading in all directions.

* This account is based on information supplied by Mr. S. Rangaswami Ayyanger, Research Ranger.

(*b*) Relief from suppression or absence or suppression does not prevent spike ; nor does reduction of foliage in plants emerging from suppression prevent it. Sudden exposure to light of suppressed plants does not induce spike. Suppression then is not a prime factor in the incidence of spike.

Evidence.—(1) Young suppressed saplings were kept tended from October 1926 in order to observe whether freedom from suppression would prevent from getting spiked. Four of the tended plants were found spiked in May 1929, but the controls remained healthy.

(2) Three hundred and nine sandal plants out of 324 artificially raised ones (1924) all of which were kept tended from their infancy were found spiked by the end of January 1934.

(3) Plants which had emerged from suppression and which had developed an abnormally large crown were selected and their foliage reduced with a view to testing the theory that the excessive demand for food materials of an abnormally developed crown on a root system which had not so developed was the precursor of spike. Thirty-five out of 121 treated trees and 12 out of 120 controls were spiked by the end of May 1929.

(4) Twenty-five trees under suppression were suddenly exposed in 1927 in order to test whether such sudden exposure would induce spike in them. None of the trees exhibited spike till the end of December 1929.

(*c*) Clear-felling and coppicing of host trees causes mortality among sandal trees parasitic on them, but does not necessarily induce spike.

Evidence.—(1) In a fuel coupe in the Naganur reserve, a plot of 10 acres containing 6,973 trees was clear-felled for fuel. During the 28 months that have since elapsed, no spike has yet appeared in the area.

(2) In a fuel coupe in Naganur reserve, over 800 sandal plants of all ages were marked over an area of 140 acres early in 1921 and the coupe was clear-felled for fuel in 1921–22. An enumeration of sandal early in 1931 showed only 52 plants surviving on the area. The rest of the trees were dead, but none on account of spike.

(*d*) Lopping and pollarding of sandal trees do not, of themselves, induce spike.

Evidence.—In a poramboke field near Denkanikota, 20 sandal trees which were regularly lopped for fodder were kept under observation from June 1926. By May 1930, the trees had been hacked, pollarded or lopped over a dozen times. One tree succumbed to this abuse, but the others have continued to live free from disease up to date.

(*e*) Deficiency of soil constituents may have a bearing on the degree of spike incidence, but the artificial supply of deficient constituents does not prevent or cure the disease.

Evidence.—Two plots, one near Aiyur and the other near Javalagiri, were opened in 1928, in order to ascertain whether the disease is due to deficiency of one or more mineral constitutents in the soil, and whether artificial compensation of the deficiency would prevent or cure the disease. Soil analyses were made. In each locality, the plots were divided into sub-plots, and three sub-plots were taken in each set so as to represent the average type of the locality and subjected to one kind of treatment. Each set was, treated with different kinds of manure, such as lime, lime and superphosphate, superphosphate, potassium and ammonium sulphate, etc. The incidence of spike was found to be lower in limed plots in one locality, where the hosts trees were plentiful, but in no case was the disease completely prevented or cured.

(*f*) Fire is not the cause of spike.

Evidence.—Two plots, each one acre in extent, were selected in 1926 near the Aiyur rest-house. One plot was burnt annually in the fire season and the other kept rigidly protected from fire. No spike appeared in the area till the end of January 1934.

(*g*) Spike is not due to want of soil aeration.

Evidence.—(1) Three hundred and twenty-four sandal plants artificially raised, by sowings made in 1924 and 1925 were kept under observation in the Javalagiri bungalow area. The soil round the plants was regularly aerated every two or three months. In spite of this 309 plants were attacked by spike by January 1934.

(2) A six-acre regeneration plot was started in the Javalagiri reserve in 1929. The plot was dug up and sandal plants were raised with various hosts. Aeration, weeding and mulching were done twice in each year. A control plot was left in which nothing was done. At the end of January 1934, 74 plants were spiked in the treated plots and 15 in the control plot. The percentage of incidence in both cases works out to about the same.

(3) In Javalagiri reserve, 250 mounds were raised, each 8 feet by $3\frac{1}{2}$ feet by 3 feet, in a selected area. Sandal seedlings raised from seeds of healthy trees standing in healthy

areas in the Indian Institute of Science were transplanted on the mounds together with various hosts. In January 1934, 52 plants were found to have succumbed to the disease, though the soil in the mounds continued to remain loose.

(4) In the manurial experimental areas in Javalagiri and Aiyur, one set of three plots in each case was aerated twice a year from 1928 to the end of September 1931. The aeration reduced the comparative incidence, but did not prevent the disease.

(*h*) Spike is not caused by damage to the roots or by removing a portion of the roots.

Evidence.—(1) In October 1931, five healthy trees were selected, their root systems partly opened out and a portion of the roots cut and removed. The cut ends of the roots were treated with tar. All the five plants have remained healthy.

(2) In August 1932, 24 healthy sandal trees were selected in Denkanikota reserve and the adjoining unreserve. One piece of root has been removed from each tree monthly; none of the trees has developed spike till the end of January 1934.

(*i*) Spike is an infectious disease.

Evidence.—(1) In pot-culture experiments in the Denkanikota Experimental Garden, patch and leaf-grafting experiments carried out in healthy plants raised from the seeds of healthy trees succeeded in transmitting the disease. The patches of bark tissue and the leaves used for grafting were derived from spiked plants. Out of 70 plants grafted 15 plants or 21·4 per cent showed the disease. Similar positive results have been obtained in pot-culture in the Indian Institute of Science. The low percentage of success is attributed to that of skill in carrying out the work.

(2) In the Kenilworth castle grounds in Hosur an area where spike was not present, grafting of diseased bark and leaf tissue was carried out on a number of sandal trees between 27th May and 20th June of 1932. The earliest manifestation of the disease occurred on 18th August 1932, i.e., 74 days after grafting. This represents the shortest period of incubation ever obtained under silvicultural conditions. In the same area, ungrafted trees which showed the disease were found on examination to have haustorial or root connections with the grafted trees.

(3) Since April 1931, batches of healthy sandal plants raised in the Institute—a locality where natural spike is not present—were placed, each plant in a separate pot, on platforms and under bushes in the heavily spiked area in Aiyur Extension II reserve. The plants were removed to the institute at the end of every two months and kept isolated. The first batch of 14 plants remained on the platforms for three months from 23rd April 1931. Of these platform plants one exhibited the disease in February 1932, *after pruning*. (Pruning is the method adopted by the Institute for forcing the early manifestation of the disease by infected plants.) Five more platform plants, two exposed between April and June 1932, two between October and December 1932 and one between April and June 19 33 have manifested the disease up to date (January 1934).

(4) Six sandal plants raised from dumps made at Denkanikota in August 1930 and transplanted into pots together with various hosts were taken to Javalagiri and transplanted again into big drums filled with sterilized soil. The drums were placed in different places in the heavily spiked area of Javalagiri reserve (bungalow observation area). Of these, three plants got spiked, one on 13th January 1933, the second on 18th March 1933 and the third on 14th January 1934.

(5) The mound planting experiment described in (*f*) (3), in which 52 plants died of spike is evidence of the presence of natural infection in the area.

(*j*) Spike is not spread through cross-fertilization taking place between an infected tree and healthy tree; spike may occur in sandal before it has become old enough to flower.

Evidence.—(1) In July 1925, ten trees in the bungalow compound at Aiyur and their flowers dusted with the pollen of flowers obtained from spiked trees. None of the trees exhibited spike till the end of 1929, when the experiment was discontinued.

(2) In the six-acre regeneration plot in the Javalagiri reserve, 22 plants raised artificially by sowings made in 1929–30 showed the disease before flowering.

(*k*) Spike is probably not spread through the soil and is certainly not exclusively or necessarily spread through the soil; the soil in contact with spiked trees does not contain any toxin or principle of infection that can communicate the disease to healthy plants.

Evidence.—(1) In October 1926, two apparently healthy trees in plot C of Nyama-sandiram Agraharam observation area were isolated by trenches three feet deep; the depth was increased to 6 feet in 1927. The area was a heavily spiked one. Twelve more

healthy plants, six in January and February 1929, and six in February 1930 were similarly isolated in the Javalagiri spiked area by trenches 8 feet deep. The results up to March 1932 were as follows :—

Year of trenching.	*Number of plants spiked.*	*Date of spiking.*
(*a*) 1926	1	June 1930
(*b*) 1929	1	June 1930
(*c*) 1930	2	June 1930
(*d*) 1926	1	May 1931
(*e*) 1929	3	May 1931

The fact that items (*a*) and (*d*) did not exhibit spike till 4 or 4½ years after isolation suggests (but by no means proves) that the infection was not through the soil. The early spiking of item (*c*) is presumably due to infection prior to isolation. A very inconclusive experiment, apparently not controlled, which shows nothing more than the fact that isolation by trenches does not prevent spike.

(2) In 1926, the spiked area in Aiyur Extension II, was isolated on the northern side by a line 100 feet wide which was cleared of all vegetation. Spike did not appear on the other side of the line till June 1930. This again suggests, but does not prove that the spread of infection is not through the soil, as otherwise the infection would have appeared earlier. It is possible, however, to adopt the same line of argument to support the view that the infection is not spread through the air. The experiment is therefore entirely inconclusive.

(3) In August 1924, six living spiked sandal trees were uprooted in the Javalagiri Bungalow Experimental area and healthy sandal plants raised from seeds of healthy mother trees in Hosur Cattle Farm were transplanted in the pits. Three of these plants died out, but the remaining three are healthy so far (January 1934).

In 1928, eight sandal plants were raised in pots filled with soil from a spiked area. All of them are continuing healthy (January 1934).

(4) The platform experiments described in (i) (3) definitely exclude soil as a possible source of infection and conclusively show that the infection can take place through a medium other than the soil.

(*l*) The root is not a region susceptible of ready infection, nor do haustorial connections play an important part in the transmission of infection. Host trees are not media of infection. The root is generally not the tissue to be first infected.

Evidence.—(1) In October 1928, 48 natural sandal seedlings and saplings, of girths varying from ½ inch to 5 inches, were selected in the spiked area of Javalagiri reserve. One of the lateral roots of each plant was exposed and treated as follows :—

(*a*) Fifteen plants were grafted with patches of bark got from the roots of spiked sandal saplings.

(*b*) Ten plants were grafted with patches of bark got from the roots of healthy sandal saplings.

(*c*) Twenty plants were not grafted on at all, but the exposed root was covered up and the plants treated as controls.

Results till November 1930 were—

(*a*) 13 per cent spiked, (*b*) 20 per cent, (*c*) 8·6 per cent spiked. The fact that the controls under (*b*) showed a higher percentage of disease indicates that a large proportion of the incidence under (*a*) is due to natural infection.

In December 1932, 12 healthy sandal plants were potted with *Acacia farnesiana* as hosts in the Experimental Gardens at Denkanikota and grafted with patches of bark derived from the roots of spiked sandal. By the end of November 1933(?) no infection had taken place in any case.

A similar experiment at the institute showed equal lack of success in transmitting the disease through grafting on roots.

(2) Twelve pairs of sandal plants were raised with *Acacia farnesiana* in pots, a pair of sandal plants in each pot. After verifying that haustorial connections had been established between the sandal plants in each pot, the disease was induced by grafting on one plant in each pot. At the end of six months in only one case had the disease been transmitted to the other plant through the haustoria.

In October 1931, in the Denkanikota non-spike area, ten pots with two or more sandal and ten with single sandal plants grown together with ' susceptible ' hosts were taken and one sandal plant in each pot was infected either by leaf insertion or by patch grafting. In February 1932, in all the twenty pots, six plants showed the disease. Of these in four pots there were healthy plants in addition to the spiked ones. So far (January 1934) none of the healthy plants in these four pots has contracted the disease.

(3) Six pairs of pots were taken and six big plants of *Acacia farnesiana* were uprooted from separate pots in which they had been grown. The root system of each *Acacia* was divided into two halves, one half being embedded in one pot and the other in an adjoining pot. Sandal was introduced into each pot. After haustorial connexions had been established, the sandal in one of a pair of pots was artificially infected with spike by grafting. So far (25 months till end of September 1933) the sandal in the second pot of each pair has not contracted the disease.

(4) In the mound planting experiment described in (i) (3), on sandal plant showed spike on 14th March 1932. This plant was uprooted and careful examination showed that there was no haustorial connexion with any host or sandal which was not on the mound itself and that both the root system and the haustoria were all in order and intact. The root system therefore was not the region initially affected.

Examination of twelve spiked plants in pots at a very early stage of the disease showed that in none of them had the roots been affected.

(*m*) Spike infection is normally through the aerial parts of the sandal tree. Spike can be artificially induced readily through patch or leaf grafts or by both together, in pot-culture as well as under silvicultural conditions.

Evidence.—(1) *Patch grafts.*—In a 2-acre plot in the Javalagiri spiked area, 44 plants of more or less the same size were grafted with patches of infective bark tissue in October and November 1928. Of these 35 plants or nearly 80 per cent got spiked by the end of June 1931.

Patch grafting was done on an area of two acres regenerated with sandal in Naganur reserve. The work was done monthly from 23rd December 1930. Out of 108 trees treated 39 or 36 per cent got spiked. In many cases fusion of the grafts did not take place.

In Denkanikota pot-culture plot twenty plants were grafted with patches; of these ten succumbed to the disease.

In the Kenilworth Castle area, a non-spike area, 52 trees were grafted with single patch grafts. Of these five have taken the disease, but in 28 cases fusion did not take place.

In the Sameri grafting plot, 246 sandal trees were grafted with patch grafts in April 1931. Of these, 82 got the disease till January 1932. This being a spiked area natural infection must have accounted for a part of the disease incidence.

(2) *Leaf grafts.*—In April 1931, 47 trees in the Sameri grafting plot were grafted with four-leaf insertions each. Of these two trees or 4 per cent got the disease by the end of January 1932.

In the Naganur 2-acre plot leaf graft was done on 101 trees. Of these two trees have succumbed to the disease.

In the Denkanikota Experimental Garden, 50 plants in pots parasitic on various hosts were grafted with leaf insertions. Of these five trees took the disease.

The low percentage of success in leaf grafting is attributed to want of technical skill. The institute has obtained 62 per cent success with leaf grafts in pot-culture.

(3) *Leaf and patch-grafts.*—In the Kenilworth Castle area, 167 trees were grafted between 27th May and 20th June 1932, with four-leaf insertions and four-patch grafts in each case. Of these 87 or 52 per cent have got the disease till the end of January 1934.

In September 1932, 25 trees in the Thalli reserve were grafted with four-leaf insertions and four patches. Four trees or 16 per cent took the disease.

(4) In the Javalagiri 6-acre regeneration plot, 116 plants were selected and caged in April 1932. The caged plants were fumigated with potasium cyanide and chloropicrin to kill all insect life. Of these 116 plants only one showed the disease on 23rd June 1932, two months after caging. In this solitary case the infection had presumably taken place before the caging was done. The remaining 115 have remained unspiked, although among the adjoining trees left uncaged 70 have got the disease. This experiment shows definitely that it is possible to prevent infection by enclosing the aerial parts of the sandal trees and that natural infection is normally through the overground part of the tree.

(*n*) While lopping of the sandal trees and fire do not, of themselves, induce spike in an area where the disease is not present, either lopping or fire has the effect of forcing apparently healthy disease-masking trees to manifest the disease early. It is presumed that

anything which stirs the tree to renewed vegetative activity, such as artificial or accidental deprival of foliage or the season of new flush, brings out the symptoms, provided the infection has already taken place.

Evidence.—It has already been shown that lopping and fire do not induce spike in a spike-free area.

(1) In the Denkanikota spiked area, 22 trees were lopped in January and February 1927. By the end of October 1928, ten trees had manifested the disease. (45 per cent.)

Between November 1932 and January 1933, 5,975 trees and 3,997 saplings were lopped in the Denkanikota reserved forest spiked area. By the end of January 1934, 998 trees or 10 per cent had manifested the disease.

In the Nyamasandiram Agraharam reserved forest, 50 trees were lopped in October 1926. Five trees manifested the disease between the end of February 1928. (10 per cent.)

In Manchi unreserve, during 1931 and 1932, 5,333 trees and 3,000 saplings were lopped in Part B. Of these 1,545 trees and saplings showed the disease up to the end of January 1934. (18·5 per cent.)

In Part A of the same unreserve 26 trees out of 307 lopped or 8·5 showed the disease.

In the Galigattam reserve, 6,325 and 2,552 saplings were lopped in 1932. Up to the end of January 1934, 973 trees and saplings or 10·9 per cent had shown the disease.

In the Javalagiri manurial plots, all the spiked trees found on the area were uprooted and all the remaining apparently healthy trees, 1,054 in number were lopped in June and July 1932. By the end of December 1933, 302 trees or 28·7 per cent had manifested spike.

In the Denkanikota Experimental Garden, 50 plants raised from healthy seeds of trees in healthy areas, grown in pots with various hosts were grafted with patch and leaf grafts in September 1931. All of them were pruned on 26th December 1931. Fifteen of them or 30 per cent manifested the disease up to the end of January 1934.

All the areas dealt with above, except the Experimental Garden at Denkanikota, were areas in which spike was already present or had newly appeared naturally.

Controlled experiments in the institute bring out the hastening effect of pruning on disease manifestation more forcibly. Forty sandal plants in combination with various hosts were infected by grafting. After four months, twenty of them were pruned and twenty were left as controls. All the pruned plants showed the disease with the appearance of the new flush, while the unpruned plants did not show spike till much later.

(2) In March and April 1931, two plots were opened in a spiked area in Aiyur reserve. One was burnt with a low ground fire and the other treated as a control. Spike incidence was recorded monthly and the results compared. The burnt plot showed significant increase in spike incidence, 16·9 per cent after a period of 8 months as against the control figure of 11·8 per cent.

(*o*) Delay in the period of fruiting is a probable preliminary symptom of spike.

Evidence.—Fifty sandal trees which had immatured fruits in April-May were kept under observation together with 50 controls. In Naganur reserve, eight of the former and one of the latter were found spiked on 10th July 1933. The remaining trees were lopped on the same date with a view to forcing out the disease in infected trees. Five of the former class and two controls exhibited the disease.

CHAPTER III—UTILIZATION OF THE PRODUCE.

SECTION 1—AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION.

54. The main requirements of the population from the forests are the following :—

(*a*) Facilities for grazing and penning cattle,

(*b*) firewood,

(*c*) bamboos, and

(*d*) small timber for domestic and agricultural purposes.

55. *Grazing and penning.*—The ryots keep large herds of cattle not only because wealth is often reckoned among them in terms of cattle and cattle breeding considerably augments their meagre agricultural income, but also for the sake of the farmyard manure without which the local soils would soon become unproductive. The availability of perennial water in the Cauvery and the Chinnar attracts large numbers of cattle to the vicinity of these rivers. Penning is extensively practised in the Cauvery valley and both local and

foreign (Mysore) cattle resort to the pens. Cattle from Mysore State have not been allowed for grazing in the forests of the North Salem division since the World War II. The incidence of grazing is so heavy in the Cauvery and Krishnagiri range forests that the provision of grazing must be considered an important, if not indeed the primary, object of management of these forests. As is usual in dry districts, facilities for grazing are the greatest demand of the rural population on the neighbouring forests.

56. *Firewood.*—A demand for firewood undoubtedly exists in the major villages adjoining the forests, such as Hosur, Denkanikota, Thalli, Kelamangalam, Pennagaram and Krishnagiri, but the demand is generally petty and is most difficult to meet under any acceptable method of exploitation.

57. *Bamboos.*—Bamboos are used by the people for a variety of purposes.

58. *Small timber for domestic and agricultural purposes.*—According to the estimates of the Revenue Department, there are in use 51,401 wooden ploughs, 46,745 iron ploughs and 125,485 carts in the Hosur taluk comprising the Denkanikota ranges and Anchetti range, 24,901 wooden ploughs, 133 iron ploughs and 2,598 carts in Krishnagiri range, 48,718 wooden ploughs, 231 iron ploughs and 2,406 carts in Dharmapuri taluk which includes Dharmapuri range. These figures relate to Government, zamindari and whole inam villages. Nearly 125,000 ploughs have thus to be constantly replaced over the whole division, but comparatively little of the timber consumed comes out of the reserves at present on account of the presence of extensive, wooded unreserves and mitta or inam lands. The problem of supply of timber for agricultural implements has not yet become pressing in this division, although in particular localities where these alternative sources of supply do not exist, people have to depend on the forest even now for their supply of small timber.

Section 2—Markets and Marketable Products.

59. *Local industries consuming forest produce.*—Except for cattle breeding and basket making which latter is a small village industry, there are no industries in the working plans area which consumed forest produce. Pasture is the only important requirement of the population from the forests, and next to sandalwood, the sale of grazing permits generally brings in the highest revenue in the division.

60. The various items of marketable products are dealt with below :—

(i) *Timber.*—*Hardwickia binata* is the only timber species which is found in abundance in the division. But although the timber of *Hardwickia* is clean, strong and durable, there is no large or ready market for it, partly because of a superstitious prejudice against its use among Tamil-speaking Hindus and partly because of a general ignorance of its utility as a first-class constructional timber. It is, however, of great potential value. Except for *Hardwickia*, the division is deficient in valuable timber species. Teak, *Dalbergia latifolia* and *Pterocarpus marsupium* are found sporadically in small patches, but not in sufficient quantity to justify organized exploitation.

(ii) *Firewood.*—There is not keen demand for firewood, except in Krishnagiri Range, for the following reasons :—

(1) The absence of urban centres in the division.

(2) The want of industries consuming firewood.

(3) The presence of extensive woodlands in zamindari or mitta lands and of extensive unreserves near centres of consumption.

These private forests are often nearer the markets than the Government forests are in and in certain cases, as in that of the Marandahalli mitta, they cut off the reserved forests from the adjoining villages. Finally, the growth in the forests dealt with is usually too poor, being merely a degraded miscellaneous scrub, to make an export trade in firewood to Bangalore a paying business. Fuel coupes under the lease system are unpopular in the plateau owing to the narrowness of the village markets and the prevalence of illicit fellings, both of which factors tend to make the lease of fuel coupes precarious business from the point of view of the lessee. Much of the firewood that comes into Denkanikota is stolen from the reserves.

The demand for charcoal is very keen after the war due to the continuance of producer gas 'Vehicles.'

(iii) *Sandalwood.*—The most important item of forest produce in the division is sandalwood. The entire output of North Salem sandalwood is consigned, after final cleaning, to the sale depot at Tiruppattur, where it is sold in auction annually together with the wood, of the Vellore divisions.

(iv) *Bamboos.*—Both *Dendrocalamus strictus* and *Bambusa arundanacea* are produced in the division, but the former is by far the commoner species. All the bamboo areas in the division have been under working. The greater part of the outturn from the working plans area finds its way to Bangalore, where it has to face competition from Mysore bamboos. Some of it goes to Pennagaram and Dharmapuri from which latter small quantities are exported to Salem. The balance is locally consumed.

(v) *Minor forest produce.*—The saleable items of minor produce in the division are the following : Tamarind, konnai (*Cassia fistula*), avaram (*Cassia auriculata*), vembadam or surulpattai (*Ventilago madraspatana*), nuxvomica (*Strychnos nux vomica*), puchankottai (*Sapindus emarginatus*), shekoy (*Acacia concinna*), serankottai (*Semecarpus anacardium*) Kadukkai (*Terminalia chebula*), kapilapodi (*Mallotus phillippinensis*), honey and wax, pungam seeds (*Pongamis glabra*), wild castor seeds (*Jatropah curcas*), thagaravarai (*Cassia tomentosa*), nellikai (*Phyllanthus emblica*) thethankottai (*Strychnos potatorum*), mangô fruits wood apple (*Feronea elephantum*), manjinar (*Crotalaria juncea*), margosa seeds, (*Azadirachta indica*), champak flowers (*Michelia champaka*), korai grass (*Cyperus rotundus*), Iluppakottai (*Cassia latifolia*), thanikkai (*Terminalia belerica*), custard apple (*Anona squamosa*), deer and sambhur horns.

Of these by far the most important item of minor produce, especially in Dharmapuri, Anchetti and Krishnagiri ranges, is tamarind. The chief markets for tanning barks are Madras and Bangalore, while the tamarind and the other items of produce are consumed locally or in Salem.

Section 3—Lines of Export.

61. *Railways.*—The narrow gauge railway line from Morappur to Hosur, which existed at the time of the preparation of the previous working plan, was discontinued during the war.

62. *Waterways.*—The Cauvery which runs along the southern boundary of the division is the only waterway which might be used for the transport of forest produce, but the presence of the falls at Hogainakal and the sluggishness of the current caused by the construction of the great dam at Mettur are serious handicaps to the development of water transport. Man-handling would be necessary both at the falls and the dam, and below the falls artificial propulsion would be required for the rapid transport of rafts or boats. However, the firewood from Perumbalaimalai and Cauvery valley fuel coupes are transported to Mettur by ' Caracles '.

63. *Roads.*—The division is fairly well served with a system of fair-weather roads. Access to Anchetti range is possible only along forest roads and as these roads are indifferently graded, earth roads, touring by motor car in this range during the rainy weather is something of a gamble, especially as one is always liable to be held up, if not indeed stuck in mid-stream, by freshes in the several unbridged streams that the road crosses. Large blocks of forest lying to the west and south of Anchetti have as yet not been opened up by roads or cart-tracks. The same applies to the block of forest occupied by the Galigattam, Guttirayan and Marandahalli reserves.

64. The following statement shows the more important roads and cart-tracks which are or might be used in the transport of forest produce :—

Statement showing the more important roads which are used in the transport of forest produce in North Salem Division.

Name of road or cart-track. (1)	*Authority maintaining the road or cart-track.* (2)	*Areas served.* (3)
	Denkanikota East Range.	
Denkanikota-Aiyur road	Forest Department ..	Tholavubeta, Manchi, Aiyur, Kempakarai, Sameri, Gulhatti and Nyamasandiram Agraharam.
Aiyur-Gulhatti road	Do. ..	Gulhatti, Manchi, Kempakarai and Tholavubetta reserves.
Aiyur-Sameri road	Do. ..	Sameri and Tholavubetta reserves.
Gulhatti-Poomarathubail	Do. ..	Manchi and Tholuvubetta.
	Denkanikota West Range.	
Devarbetta-Gopasandiram road ..	Forest Department ..	Thalli reserve.
Thalli-Javalagiri	Do. ..	Javalagiri, Hulibanda and Pane reserves.
Sulakunta-Javalagiri cart-track	Do. ..	Do.

Name of road or cart-track. (1)	*Authority maintaining the road or cart-track.* (2)	*Areas served.* (3)
	Denkanikota West Range—cont.	
Kundukota-Anchetti road	Forest Department	Pane and Hulibanda reserves.
Thalli-Bangalore road	Highways Department and Mysore State.	Pane, Hulibanda, Javalagiri and Thalli reserves.
Thalli-Hosur road	Highways Department.	Do.
Thalli-Denkanikota road	Do.	Do.
Denkanikota-Kundukota road	Do.	Naganur, Pane and Hulibanda reserves.
Denkanikota-Bangalore road	Highways Department and Mysore State.	All the reserves in Denkanikota East and West ranges and Anchetti range.
Denkanikota-Kelamangalam road	Do.	Do.
Kelamangalam-Hosur road	Do.	Sanamavu and Hudedurgam reserves.
Kelamangalam-Rayakota road	Do.	Sanamavu reserve.
Hosur-Krishnagiri road	Do.	Do.
Hosur-Rayakota road	Do.	Do.
	Dharmapuri Range.	
Anaibiddahalla-Pennagaram road	Forest Department	Wodapatti, Pennagaram and Cuttirayan reserves and reserves of Anchetti range.
Hogainakal-Biligundlu road	Do.	Wodapatti and Biligundlu reserves.
Hogainakal-Pennagaram road	Highways Department.	Wodapatti, Baiyanurmalai and Pennagaram reserves.
Pennagaram-Dharmapuri road	Do.	Wodapatti, Pennagaram, Guttirayan, Biligundlu and Baiyanurmalai reserves.
Pennagaram-Palakole road	Do.	Kesaraguli, Morappur and Pikkilimalai reserves.
Dharmapuri-Rayakota road	Do.	Marandahalli, Galigattam, Kesaraguli, Morappur, etc., reserves.
Dharmapuri-Krishnagiri road	Do.	Reserves of Dharmapuri range.
Marandahalli-Rayakota road	Do.	Marandahalli reserve.
Dharmapuri-Salem road	Do.	Reserves of Dharmapuri range.
	Anchetti Range.	
Anchetti-Anaibiddahalla road	Forest Department	Reserves of Anchetti range.
Anchetti-Kundukota road	Do.	Reserves of Anchetti range and Pane and Hulibanda reserves of Denkanikota West range.
Anchetti-Taggati road	Do.	Ubrani, Bilikal, Urigam and Taggati of Anchetti range and Hulibanda reserve of Denkanikota West range.

SECTION 4.—METHODS OF EXPLOITATION AND THEIR COST.

65. *Sandalwood*—(*a*) *Exploitation.*—The exploitation of sandalwood is carried out departmentally at every stage under the standard sandalwood working rules. The extraction, rough-cleaning and transport of the sandalwood are paid for on outturn at the rate of 7 annas a quarter of 28 lb.

In 1935–36 and 1936–37 it was found that as much as one-third of the extracted trees contained no heart-wood, while the total number of trees exploited was no less than 94,439 and coupes partly worked. In order to go over the entire area of the coupes, it was decided not to enumerate and extract the dead trees not containing heart-wood. While carrying out the enumeration, the trees are tested for heart-wood by cutting through the sapwood at the base of the tree.

In the Denkanikota ranges and in Anchetti range, the cost of enumeration varies from 1 anna for Dharmapuri and Krishnagiri ranges and 1 anna 6 pies for other ranges. In Dharmapuri range, the rate is 6 pies per acre. The rough-cleaned wood of Denkanikota East, Denkanikota West, Krishnagiri and Anchetti ranges is brought to the final cleaning depot at Denkanikota, while that of Dharmapuri range is consigned to Dharmapuri for final cleaning. The final-cleaned wood is despatched by road from these two depots to the sale depot at Tiruppattur, where it is sold twice a year in auction.

SECTION 5—PAST AND CURRENT PRICES.

66. The following statements show the prices realized for fuel and bamboo coupes and the average price per ton of each class of sandalwood over a series of years :—

Statement showing prices obtained for fuel coupes in each of the ranges in Salem North Division from 1934 to 1938.

Year. (1)	*Name of series.* (2)	*Name of reserved forest.* (3)	*Coupe number.* (4)	*Area in acres.* (5)	*Revenue realized.* (6) RS. A. P.	*Rate per acre.* (7) RS. A. P.	*Remarks.* (8)
		DENKANIKOTA EAST RANGE.					
1934–35	Denkanikota	Denkanikota	XVIII	38	..	..	Not sold.
	Hudedurgam	Hudedurgam	XIX	50	185 0 0	..	
1935–36	Denkanikota	Denkanikota	I	33	165 0 0	5 0 0	
	Hudedurgam	Hudedurgam	I	63·50	79 6 0	1 4 0	
1936–37	Denkanikota	Denkanikota	II	42	..	..	Sale dropped.
	Hudedurgam	Hudedurgam	II	63	149 0 0	2 6 0	
1937–38	Do.	Do.	I (arrear area).	40	52 8 0	1 5 0	
	Do.	Do.	III	58	..	..	Sale dropped.
	Denkanikota	Denkanikota	I	20	..	..	
	Do.	Do.	II	42	..	..	
1938–39	Hudedurgam	Hudedurgam	III	58	68 14 0	1 3 0	
	Do.	Do.	II	21	26 4 0	1 4 0	
	Denkanikota	Denkanikota	I	20	..	..	Sale dropped.
	Do.	Do.	II	42	..	..	
	Do.	Do.	III	44	..	..	
	Hudedurgam	Hudedurgam	IV	47	52 14 0	1 2 0	
1939–40	Denkanikota	Denkanikota	III	40	..	..	Working of coupes discontinued as per Chief Conservator's Orders No. 343/40-B, dated 7th August 1940.
	Hudedurgam	Hudedurgam	V	60	..	..	
1940–41–1945	....	....	..	..	..	..	No sale.
1945	Denkanikota	Denkanikota	II	42	304 8 0	7 4 0	
1946	Do.	Do.	III	35	420 0 0	12 0 0	
	Do.	Do.	IV	40	320 0 0	8 0 0	
1947	....	....	..	..	..	..	No sale.
1948	Denkanikota	Denkanikota	V	40	..	..	Sale put off till the revision of the working plan.
	Do.	Do.	VI	40	..	..	
		DENKANIKOTA WEST RANGE.					
1934–35	....	....	..	..	..	..	No sale.
1935–36	Sanamavu	Sanamavu	I	68	68 0 0	1 0 0	
1936–37	Do.	Do.	II	65	142 3 0	2 3 0	

1937–38	Do.	Do.	III	65	113 12 0	1 12 0	
1938–39	Do.	Do.	IV	80	165 0 0	2 1 0	
	Do.	Do.	V	78	170 10 0	2 3 0	
1939–40	Do.	Do.	VI	77	115 8 0	1 8 0	
1940–41	....	....	..	..	..	..	No sale.
1941–42	Sanamavu	Sanamavu	VII	82	276 12 0	3 6 0	
1942	Do.	Do.	VIII	78	234 0 0	3 0 0	
1943	Do.	Do.	IX	84	341 4 0	4 1 0	
1944	Do.	Do.	X	84	1,008 0 0	12 0 0	
1945	Do.	Do.	XI	76	817 0 0	10 12 0	
1946	Do.	Do.	XII	74	518 0 0	7 0 0	
1947	Do.	Do.	XIII	114	1,710 0 0	15 0 0	
1948	Do.	Do.	XIV	79	869 0 0	11 0 0	
		DHARMAPURI RANGE.					
1934–35	Pennagaram	Pennagaram	XII	50	..	..	Sale dropped.
	Marandahally	Marandahally	IV	50	..	..	(Sale dropped.)
1935–36	Pennagaram	Pennagaram	I	..	..	..	Do.
1936–37	Do.	Do.	I	91	91 0 0	1 0 0	
1937–38	Do.	Do.	II	80	70 0 0	0 14 0	
1938–39	Do.	Do.	I	67	..	..	Sale dropped.
	Do.	Do.	III	80	..	..	Tender rejected.
	Do.	Do.	II	47	..	..	Sale dropped.
1939–40	Do.	Do.	IV	79	..	..	Do.
1940–41	Thoppur	Thoppur	VI	112	644 0 0	5 2 0	
	Parigam	Parigam	VI	96	432 0 0	4 8 0	
	Thoppur	Thoppur	VII	55	17 0 0	..	Sale dropped.
	Kothur	Kothur	III	..	..	..	(Sale dropped.)
1941–42	Pennagaram	Pennagaram	IV	76	76 0 0	1 0 0	
	Thoppur	Thoppur	VII	56	476 0 0	8 8 0	
	Parigam	Parigam	VII	92	667 0 0	7 4 0	
	Pennagaram	Pennagaram	I }	67 }	135 0 0	1 3 0	
			II }	47 }	..	..	
		Mettur Stanley Reservoir submergible area—Part II sold for Rs. 3,000–0–0.					
1942	Pennagaram	Pennagaram	V	80	220 0 0	2 12 0	
	Thoppur	Thoppur	VIII	26	315 4 0	12 2 0	
	Parigam	Parigam	VIII	100	1,481 4 0	14 13 0	
	Cauvery Valley	Badanavadi	I	196	5,598 4 0	28 9 0	
	Bevanurmalai	Pennagaram	I	104	4,686 4 0	45 1 0	
	Thoppur (Kumri area)	Thoppur	I }	37 }	92 8 0 }	2 8 0 }	Two coupes were sold together.
			II }	47 }	141 0 0 }	3 0 0 }	
		Mettur Stanley Reservoir submergible area—Part II sold for Rs. 4,005–0–0.					

Year. (1)	*Name of series.* (2)	*Name of reserved forest.* (3)	*Coupe number.* (4)	*Area in acres.* (5)	*Revenue realized.* (6) RS. A. P.	*Rate per acre.* (7) RS. A. P.	*Remarks.* (8)
		Dharmapuri Range—*cont.*					
1943	Pennagaram	Pennagaram	VI	80	640 0 0	8 0 0	
	Thoppur	Thoppur	IX	150	2,362 8 0	15 12 0	
	Parigam	Parigam	IX	124	1,519 0 0	12 6 0	
	Perumbalamalai	Perumbalamalai	I	121	3,176 4 0	26 4 0	
	Cauvery Valley	Badanavadi	II	133	3,358 4 0	25 4 0	
	Bevanurmalai	Bevanurmalai	II	109	2,493 0 0	27 0 0	
		Mettur Stanley Reservoir submergible area—Part III sold for Rs. 17,000–0–0.					
		Mettur Stanley Reservoir submergible area—Part II sold for Rs. 6,000–0–0.					
1944	Thoppur	Thoppur	X	156	3,432 0 0	22 0 0	
	Pennagaram	Pennagaram	VII	79	869 0 0	11 0 0	
	Parigam	Parigam	X	168	5,208 0 0	31 0 0	
	Cauvery Valley	Badanavadi	III	97	8,432 0 0	86 0 0	
	Bevanurmalai	Bevanurmalai	III	77	6,314 0 0	82 0 0	
	Perumbalamalai	Perumbalamalai	II	102	9,792 0 0	96 0 0	
1945	Pennagaram	Pennagaram	VIII	84	1,092 0 0	13 0 0	
	Thoppur	Thoppur	XI	96	1,632 0 0	17 0 0	
	Badanavadi	Badanavadi	III	112	1,960 0 0	17 8 0	
	Parigam	Parigam	XI	113	2,542 0 0	22 8 0	
	Cauvery Valley	Badanavadi	IV	104	5,356 0 0	51 8 0	
	Bevanurmalai	Bevanurmalai	IV	76	1,533 4 0	20 7 0	Two coupes were sold together.
	Do.	Do.	II	63	1,287 9 0	20 7 0	
	Perumbalamalai	Perumbalamalai	III	104	3,796 0 0	36 7 0	
	Thoppur	Thoppur	III (arrear area.)	16	272 0 0	17 0 0	
1946	Pennagaram	Pennagaram	IX	84	1,176 0 0	14 0 0	
	Thoppur	Thoppur	XII	106	5,936 0 0	56 0 0	
	Parigam	Parigam	XII	146	4,726 0 0	17 0 0	Two coupes were sold together.
	Badanavadi	Badanavadi	IV	132	..	..	
	Cauvery Valley	Do.	V	102	2,360 0 0	20 0 0	Do.
	Do.	Do.	I	16 (arrear area).	..	..	
	Perumbalamalai	Perumbalamalai	IV	93	2,976 0 0	32 0 0	Do.
	Bevanurmalai	Bevanurmalai	V	74	1,938 0 0	17 0 0	
	Do.	Do.	III	40 (arrear area).	..	..	
		Mettur Stanley Reservoir submergible area—Part I and Portion of Part II sold for Rs. 850–0–0.					
1947	Pennagaram	Pennagaram	X	82	656 0 0	8 0 0	
	Thoppur	Thoppur	XIII	82	4,920 0 0	60 0 0	
	Cauvery Valley	Badanavadi	VI	104	7,800 0 0	75 0 0	
	Badanavadi	Do.	V	133	3,990 0 0	30 0 0	
	Parigam	Parigam	XIII	108	5,940 0 0	55 0 0	
	Bevanurmalai	Bevanurmalai	VI	74	6,400 0 0	50 0 0	Two coupes were sold together.
	Do.	Do.	IV (arrear area).	54			
	Perumbalamalai	Perumbalamalai	V	108	13,644 0 0	99 0 0	Do.
	Do.	Do.	III (arrear area).	28			

1948	Muthur	....	VI	120	4,800 0 0	40 0 0	
	Pennagaram	....	XI	79	790 0 0	10 0 0	
	Thoppur	....	XIV	97	7,663 0 0	79 0 0	
	Parigam	....	XIV	108	3,456 0 0	32 0 0	
	Cauvery Valley	....	VII	97	7,275 0 0	75 0 0	
	Badanavadi	....	VI	148	11,248 0 0	76 0 0	
	Bevanurmalai	....	VII	86	7,568 0 0	88 0 0	
	Perumbalamalai	....	VI	109	6,758 0 0	62 0 0	
	Badanavadi unreserves	S. Nos. 496-A, B and C and S. No. 660 sold for.	..	..	16,750 0 0	..	
	Badravalli unreserves	S. Nos. 661 and 476 sold for	..	..	400 0 0	..	
		KRISHNAGIRI RANGE.					
1939–40	Bargur	Bargur	III and IV	89 117	463 8 0	2 4 0	Lease transferred from Central Salem Division.
	Thoppur	Thoppur	III V	100 132	493 0 0	2 2 0	Do.
1940–41	Maharajakadai East	Maharajakadai	IV	150	600 0 0	4 0 0	
	Maharajakadai West	Do.	III	123	..	..	Sale dropped.
	Neralapalli	Neralapalli	III	61	194 8 0	3 4 0	
	Neralakotta	Neralakotta	I	552	2,760 0 0	5 0 0	
	Bargur	Bargur	IV	35	148 12 0	4 4 0	
	Nandibanda	Nandibanda	IV	37	129 8 0	3 8 0	
1941–42	Maharajakadai, East	Maharajakadai	V	135	540 0 0	4 0 0	
	Bargur	Bargur	V	38	266 0 0	7 0 0	
	Maharajakadai, West	Maharajakadai	IV	122	316 0 0	3 0 0	
	Nandibanda	Nandibanda	V	50	250 0 0	5 0 0	
	Neralapalli	Neralapalli	IV	76	1,159 0 0	15 4 0	
	Do.	Do.	II	20 (arrear area).	65 0 0	3 4 0	
	Kothur	Kothur	I	93	465 0 0	5 0 0	
	Neralakota	Neralakota	II	524	2,260 0 0	5 0 0	
1942	Neralapalli	Neralapalli	V	62	682 0 0	11 0 0	
	Maharajakadai, West	Maharajakadai	VI	100	556 4 0	5 9 0	
	Maharajakadai, East	Do.	V	126	322 14 0	2 9 0	
	Bargur	Bargur	VI	39	175 8 0	4 8 0	
	Nandibanda	Nandibanda	VI	40	265 0 0	4 10 0	
	Maharajakadai, East	Maharajakadai	III	42 (arrear area).	65 10 0	1 9 0	
	Neralakota	Neralakota	III	260	1,300 0 0	5 0 0	
1943	Neralapalli	Neralapalli	VI	61	615 0 0	10 4 0	
	Maharajakadai, East	Maharajakadai	VII	140	1,155 0 0	8 4 0	
	Maharajakadai, West	Do.	III	123	492 0 0	4 0 0	
	Do.	Do.	VI	136	476 0 0	3 8 0	
	Bargur	Bargur	VII	39	341 4 0	8 12 0	
	Nandibanda	Nandibanda	VII	40	350 0 0	8 12 0	
	Kothur	Kothur	II	93	279 0 0	3 0 0	
	Neralakota	Neralakota	IV	304	1,824 0 0	6 0 0	
	Thoppur	Thoppur (Kumri area)	..	36	270 0 0	7 8 0	

Year. (1)	*Name of series.* (2)	*Name of reserved forest.* (3)	*Coupe number.* (4)	*Area in acres.* (5)	*Revenue realized.* (6) RS. A. P.	*Rate per acre.* (7) RS. A. P.	*Remarks.* (8)
		KRISHNAGIRI RANGE—*cont.*					
1944	Neralapalli	Neralapalli	VII	60	1,200 0 0	20 0 0	
	Maharajakadai, East	Maharajakadai	VIII	134	4,824 0 0	36 0 0	
	Maharajakadai, West	Do.	VII	112	3,360 0 0	30 0 0	
	Bargur	Bargur	VIII	38	760 0 0	20 0 0	
	Nandibanda	Nandibanda	VIII	40	1,080 0 0	27 0 0	
	Kothur	Kothur	III	75	2,250 0 0	30 0 0	
1945	Hudedurgam	Hudedurgam	V	64	..	..	Sale dropped.
	Do.	Do.	I	30			
	Do.	Do.	III	57			
	Do.	Do.	IV	37			
1945	Neralapalli	Neralapalli	VIII	66	3,432 0 0	52 0 0	
	Maharajakadai, East	Maharajakadai	IX	117	..	..	Sale dropped.
	Maharajakadai, West	Do.	VIII	134	1,742 0 0	13 0 0	
	Bargur	Bargur	IX	40	660 0 0	16 8 0	
	Nandibanda	Nandibanda	IX	40	1,220 0 0	30 8 0	
	Kothur	Kothur	IV	88	2,112 0 0	24 0 0	
1946	Maharajakadai, East	Maharajakadai	X	120	1,920 0 0	16 0 0	
	Do.	Do.	II	102 (arrear coupe).	1,734 0 0	17 0 0	
	Maharajakadai, West	Do.	IX	115	2,875 0 0	25 0 0	
	Bargur	Bargur	X	39	312 0 0	8 0 0	
	Nandibanda	Nandibanda	X	35	525 0 0	15 0 0	
	Kothur	Kothur	V	82	1,312 0 0	16 0 0	
	Neralapalli	Neralapalli	IX	64	1,664 0 0	26 0 0	
	Hudedurgam	Hudedurgam	V	(Arrear coupe).	..	..	Sale dropped.
	Do.	Do.	I				
	Do.	Do.	III				
	Do.	Do.	IV				
1947	Maharajakadai, East	Maharajakadai	XI	144	2,160 0 0	15 0 0	
	Maharajakadai, West	Do.	X	114	4,560 0 0	40 0 0	
	Bargur	Bargur	XI	40	1,120 0 0	28 0 0	
	Nandibanda	Nandibanda	XI	34	850 0 0	25 0 0	
	Do.	Do.	IX	40 (arrear coupe).	1,600 0 0	40 0 0	
	Kothur	Kothur	VI	43	731 0 0	17 0 0	
	Neralapalli	Neralapalli	X	65	2,340 0 0	36 0 0	
	Hudedurgam	Hudedurgam	I	30	620 0 0	5 0 0	
	Do.	Do.	III	57			
	Do.	Do.	IV	37			
1948	Maharajakadai, East	Maharajakadai	XII	125	3,750 0 0	30 0 0	
	Maharajakadai, West	Do.	XI	120	3,840 0 0	32 0 0	
	Bargur	Bargur	XII	46	1,334 0 0	29 0 0	
	Nandibanda	Nandibanda	XII	39	1,365 0 0	35 0 0	
	Kothur	Kothur	VII	37	925 0 0	25 0 0	
	Neralapalli	Neralapalli	XI	69	3,174 0 0	46 0 0	
	Hudedurgam	Hudedurgam	I	61	305 0 0	5 0 0	

Statement showing prices obtained for the bamboo coupes in each of the Ranges in Salem North Division from **1934–35** *to* **1948–49.**

Year.	*Name of series.*	*Name of reserved forest.*	*Coupe number.*	*Area in acres.*	*Revenue realized in rupees.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Denkanikota East Range.				
1934–35	Aiyur	Aiyur and Aiyur Extension I (Parts)	I	3,286	330	
	Sameri	....	I	3,252	..	Sale dropped.
	Tholavubetta	Tholavubetta	I	3,308	660	
	Gulhatti	Gulhatti (Part)	II	3,552	186	
	Do.	....	III	1,712		
	Do.	....	I	1,800	..	Sale dropped.
	Manchi	Manchi (Part)	I	1,632	310	
	Kempakarai	Kempakarai (Part)	I	2,526	490	
1935–36	Aiyur	Aiyur and Aiyur Extension I (Parts)	I	1,687	187	
	Sameri	....	I	2,411	305	
	Tholavubetta	Tholavubetta	I	3,419	999	
	Gulhatti	Gulhatti (Part)	I	1,795	999	
	Manchi	Manchi (Part)	I	1,842	300	
	Kempakarai	Kempakarai (Part)	I	3,072	500	
	Manchi Village Section	....	I	524	..	Sale dropped.
1936–37	Aiyur	Aiyur and Aiyur Extension I (Parts)	II	2,860	100	
	Tholavubetta	Tholavubetta (Part)	II	2,049	600	
	Gulhatti	Gulhatti (Part)	II	2,301	231	
	Manchi	Manchi (Part)	II	2,057	205	
	Manchi village unreserve	....	II	242	32	
	Sameri	Sameri (Part)	II	1,462	460	
	Kempakarai	Kempakarai (Part)	II	1,729	306	
1937–38	Aiyur	Aiyur and Aiyur Extension I (Parts).	III	2,365	700	
	Sameri	Sameri (Part)	III	1,645	435	
	Tholavubetta	Tolavubetta (Part)	III	2,641	1,005	
	Manchi	Manchi (Part)	III	'1,285	701	
	Kempakarai	Kempakarai (Part)	III	1,673	450	
	Manchi Village Series	....	III	..	..	Sale dropped.
	Irudukota, Bellamugalam, Hanumanthapuram and Sandanapatti.	Unreserves	..	..	310	
1938–39	Aiyur	Aiyur and Aiyur Extension I (Parts).	I II III	1,687 2,860 2,365	650	Coupes I, II and III were sold for a period of three years from 1st April 1938 to 31st March 1941.
	Sameri	Aiyur (Part), Nyamasandiram Agraharam, Aiyur Extension II and I (Part).	I	2,411	130	
	Tholavubetta	Tholavubetta	I	3,419	201	
	Gulhatti	Gulhatti (Part)	I, II and III	1,795 2,301	875	Coupes I, II and III were sold for a period of three years from 1st April 1938 to 31st March 1941.
	Manchi	Manchi (Part)	I, II and III	1,842 2,057 1,285	1,211	Do.
	Kempakarai	Kempakarai (Part)	I, II and III	3,072 1,729 1,673	1,300	Do.
	Manchi village	....	I, II and III	524 242 317	201	Do.

Year. (1)	Name of series. (2)	Name of reserved forest. (3)	Coupe number. (4)	Area in acres. (5)	Revenue realized in rupees. (6)	Remarks. (7)
		Denkanikota East Range—cont.				
1939–40	Sameri	Aiyur (Part) and Sameri	II and III	1,462 } 1,645 }	..	Sale dropped.
	Tholavubetta	Tholavubetta (Part)	II and III	2,049 } 2,641 }	1,932	Two coupes were sold together.
1940–41	Unreserves of Bettamangalam, Sandanapalli, Irudukotta and Hanumanthapuram.	....	..	5,761·59	200	
	Sameri	Sameri (Part)	III	1,645	226	
	Urigam	Urigam	III	2,436	30	
1941–42	Aiyur	Aiyur and Aiyur Extension I (Parts).	I	1,687	700	
	Sameri	Sameri (Part)	I	2,411	..	Sale dropped.
	Tholavubetta	Tholavubetta (Part)	I	3,419	415	
	Gulhatti	Gulhatti (Part)	I	1,795	700	
	Manchi	Manchi (Part)	I	1,842	1,350	
	Kempakarai	Kempakarai (Part)	I	3,072	775	
	Manchi (Village Section)	....	I	524	300	
1942–43	Aiyur	Aiyur and Extension I Reserved Forest (Parts).	II	2,860	232	
	Sameri	Aiyur (Part)	II	1,462	285	
	Tholavubetta	Tholavubetta (Part)	II	2,049	2,000	
	Gulhatti	Gulhatti (Part)	II	2,301	270	
	Manchi (Village Section)	....	II	242	55	
	Kempakarai	Kempakarai Part)	II	1,729	401	
	Manchi Commercial Section	....	II	2,057	355	
1943–44	Aiyur	Aiyur and Extension I Reserved Forests (Parts).	III	2,365	700	
	Sameri	Sameri (Part)	III	1,645	1,770	
	Tholavubetta	Tholavubetta (Part)	III	2,641	2,705	
	Gulhatti	Gulhatti (Part)	III	3,932	1,180	
	Manchi	Manchi (Part)	III	1,285	2,650	
	Kempakarai	Kempakarai (Part)	III	1,673	1,950	
	Manchi unreserves	....	III	317	520	
	Unreserves of Bettamangalam, Sandanapalli, Irudukotta and Hanumanthapuram.	....	..	..	480	
1944–45	Aiyur	Aiyur and Extension I Reserved Forest (Parts).	I	1,687	3,005	
	Sameri	Sameri (Part)	I	2,411	4,000	
	Tholavubetta	Tholavubetta	I	3,419	5,115	
	Gulhatti	Gulhatti (Part)	I	1,795	6,005	
	Manchi	Manchi (Part)	I	1,842	4,100	
	Kempakarai	Kempakarai (Part)	I	3,072	4,100	
	Manchi (Village Section)	....	I	524	1,400	
1945–46	Aiyur	Aiyur and Extension I Reserved Forest (Parts).	II	2,860	1,135	
	Sameri	Sameri (Part)	II	1,462	3,999	
	Tholavubetta	Tholavubetta (Part)	II	2,049	3,010	
	Gulhatti	Gulhatti (Part)	II	2,301	2,505	
	Manchi	Manchi	II	2,057	2,505	
	Kempakarai	Kempakarai (Part)	II	1,729	2,115	
	Manchi (Village Section)	....	II	242	655	

1946–47	Aiyur	Aiyur and Extension I Reserved Forests (Parts).	III	2,365	1,000	
	Sameri	Sameri (Part)	III	1,645	1,050	
	Tholavubetta	Tholavubetta (Part)	III	2,641	1,150	
	Gulhatti	Gulhatti (Part)	III	3,932	700	
	Manchi Commercial Section	....	III	1,285	1,600	
	Kempakarai	Kempakarai (Part)	III	1,673	6,000	
	Manchi (Village section)	....	III	317	800	
	Unreserves of Bettamangalam, Sandanapalli Irudukota and Hanumanthapuram.	....	..	..	400	
1947–48	Aiyur	Aiyur and Extension I Reserved Forests (Parts).	I	1,687	7,005	
	Sameri	Sameri (Part)	I	2,411	11,000	
	Tholavubetta	Tholavubetta (Part)	I	3,419	5,206	
	Gulhatti	Gulhatti (Part)	I	1,795	6,000	
	Manchi	Manchi (Part)	I	1,842	6,000	
	Kempakarai	Kempakarai (Part)	I	3,072	7,000	
	Manchi (Village Section)	....	I	524	810	
1948–49	Aiyur	Aiyur and Extension I Reserved Forests (Parts).	II	2,860	3,500	
	Sameri	Sameri (Part)	II	1,462	7,005	
	Tholavubetta	Tholavubetta (Part)	II	2,049	4,010	
	Gulhatti	Gulhatti (Part)	II	2,301	2,460	
	Manchi	Manchi (Part)	II	2,057	4,500	
	Kempakarai	Kempakarai (Part)	II	1,729	4,000	
	Manchi (Village Section)	....	II	242	760	
		Denkanikota West Range.				
1934–35	Pane East	Pane (Part)	I	5,127	100	
	Javalagiri	Javalagiri (Part)	I	3,200	250	
	Thalli North	Thalli	I	2,208	140	
	Thalli South	Do.	I	2,053	225	
	Hulibanda	Hulibanda (Part)	I	2,330	225	
935–36	Thalli North	Thalli	I	2,300	110	
	Thalli South	Do.	I	841	125	
	Javalagiri	Javalagiri (Part)	I	3,405	226	
	Pane West	Pane	I	4,039	116	
	Hulibanda	Hulibanda	I	2,040	109	
	Pane East	Pane	I	2,005	102	
	Madakkallu (Village Section)	....	I	2,545	70	
	Kachuvadi (Village Section)	....	I	5,125	67	
1936–37	Thalli South	Thalli	II	1,528	230	
	Thalli North	Do.	II	2,100	110	
	Javalagiri	Javalagiri (Part)	II	3,493	238	
	Pane West	Pane (Part)	II	4,866	126	
	Pane East	Do.	II	1,984	101	
	Hulibanda	Hulibanda (Part)	II	2,229	120	
	Madakkallu (Village Section)	....	II	3,282	100	
	Kachuvadi (Unreserve)	....	II	7,070	..	Sale dropped.
1937–38	Thalli South	Javalagiri (Part)	III	1,150	170	
	Javalagiri	Do.	III	865	170	
	Pane East	Pane (Part)	III	1,530	..	Sale dropped.
	Pane West	Do.	III	2,963	275	
	Hulibanda	Hulibanda (Part)	III	2,832	160	
	Kachuvadi (Village Section)	....	III	6,339	37	
	Thalli North	Thalli (Part)	III	3,409	85	
	Madakkallu (Village Section)	....	III	6,214	100	

Year.	Name of series.	Name of reserved forest.	Coupe number.	Area in acres.	Revenue realised in rupees.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Denkanikota West Range—cont.				
1938–39	Thalli North	Thalli (Part)	I	2,300	230	Thalli coupes I, II and III were sold together for a period of 3 years from 1st April 1938 to 31st March 1941.
			II	2,100		
			III	3,409		
	Thalli South	Thalli (Part) and Javalagiri (Part).	I	841	315	Thalli South coupes I, II and III were sold together for a period of 3 years from 1st April 1938 to 31st March 1941.
			II	1,528		
			III	1,150		
	Javalagiri	Javalagiri	I	3,405	636	Javalagiri coupes I, II and III were sold together for a period of 3 years from 1st April 1938 to 31st March 1941.
			II	3,493		
			III			
	Pane West	Pane (Part)	I	4,039	150	....
	Pane East	Do.	I	2,005	315	Pane East coupes I, II and III were sold together for a period of 3 years from 1st April 1938 to 31st March 1941.
			II	1,984		
			III	1,530		
	Hulibanda	Hulibanda (Part)	I	2,949	400	Hulibanda Coupes I, II and III were sold together for a period of 3 years from 1st April 1938 to 31st March 1941.
			II	2,229		
			III	2,832		
	Madakkallu (Village Section)	....	I	2,515	85	....
	Kachuvadi (Village Section)	....	I	5,125	105	Kachuvadi coupes I, II and III were sold together for a period of 3 years from 1st April 1938 to 31st March 1941.
			II	7,070		
			III	6,339		
1939-40	Pane West	Pane	II	4,866	555	Coupes II and III were sold for 2 years from 1st April 1939 to 31st March 1941.
			III	2,963		
	Madakkallu (Village Section)	....	II	3,282	175	....
			III	6,214		
1941-42	Thalli North and South (Parts)	Thalli	I	2,300	70	
	Thalli South	Do.	I	841	500	
	Javalagiri	Javalagiri (Part)	I	3,405	680	
	Pane West	Pane	I	4,039	505	
	Pane East	Do.	I	2,005	2,000	
	Madakkallu (Village Section)	....	I	2,515	130	
	Hulibanda	Hulibanda (Part)	I	2,949	405	
	Kachuvadi (Village Section)	....	I	5,125	75	
1942-43	Thalli North	Thalli Extension (Part)	II	2,100	135	
	Thalli South	Thalli	II	1,528	115	
	Javalagiri	Javalagiri (Part)	II	3,493	215	
	Pane West	Pane	II	4,866	150	
	Pane East	Do.	II	1,984	120	
	Hulibanda	Hulibanda (Part)	II	2,229	550	
	Madakkallu (Village Section)	....	II	3,282	70	

1943–44	Thalli North	Thalli (Part)	III	3,409	215	
	Thalli South	Javalagiri (Part)	III	1,150	210	
	Javalagiri	Do.	III	865	895	
	Pane West	Pane (Part)	III	2,963	205	
	Pane East	Do.	III	1,530	120	
	Hulibanda	Hulibanda (Part)	III	2,832	1,925	
	Madakkallu	Anchetti	III	6,214	205	
	Kachuvadi	(Marandapalli and Mallikajudagam Parts.)	III	6,339	110	
1944–45	Thalli North	Thalli (Part)	I	2,300	450	
	Thalli South	Do.	I	841	1,650	
	Javalagiri	Javalagiri (Part)	I	3,405	1,210	
	Pane West	Pane (Part)	I	4,039	1,650	
	Pane East	Do.	I	2,005	915	
	Hulibanda	Hulibanda (Part)	I	2,949	1,500	
	Madakkallu	Anchetti	I	2,515	580	
	Kachuvadi (Village Section)	....	I	5,125	505	
1945–46	Thalli North	Thalli (Part)	II	2,100	265	
	Thalli South	Do.	II	1,528	1,000	
	Javalagiri	Javalagiri (Part)	II	3,493	895	
	Pane West	Pane (Part)	II	4,866	685	
	Pane East	Do.	II	1,984	550	
	Hulibanda	Hulibanda (Part)	II	2,229	1,370	
	Madakkallu (Village Section)	....	II	3,282	420	
	Kachuvadi (Village Section)	....	II	7,070	..	Sale dropped.
1946–47	Thalli North	Thalli (Part)	II	3,409	170	
	Thalli South	Javalagiri (Part)	III	1,150	250	
	Javalagiri	Do.	III	865	975	
	Pane West	Pane (Part)	III	2,963	1,050	
	Pane East	Do.	III	1,530	1,100	
	Hulibanda	Hulibanda (Part)	III	2,832	750	
	Madakkallu (Village Section)	....	III	6,214	175	
	Kachuvadi (Village Section)	....	III	6,339	260	
1947–48	Thalli North	Thalli (Part)	I	2,300	240	
	Thalli South	Do.	I	841	430	
	Javalagiri	Javalagiri (Part)	I	3,405	855	
	Pane East	Pane (Part)	I	2,005	1,010	
	Pane West	Do.	I	4,039	2,100	
	Hulibanda	Hulibanda (Part)	I	2,949	1,505	
	Madakkallu (Village Section)	....	I	2,515	515	
	Kachuvadi (Village Section)	....	I	5,125	285	
1948–49	Thalli North	Thalli (Part)	II	2,100	370	
	Thalli South	Do.	II	1,528	690	
	Javalagiri	Javalagiri (Part)	II	3,493	655	
	Pane West	Pane (Part)	II	4,866	815	
	Pane East	Do.	II	1,984	800	
	Hulibanda	Hulibanda (Part)	II	2,229	1,310	
	Madakkallu (Village Section)	....	II	3,282	300	
	Kachuvadi (Village Section)	....	II	7,070	70	
		Dharmapuri Range.				
1934–35	Kottur	Kottur	I	1,168	400	
	Marandahalli	Marandahalli (Part)	I	579	400	
	Panjapalli	Marandahalli Extension (Part)	I	—	—	Sale dropped.
	Galligattam	Galligattam (Part)	I			
	Guttirayan	Guttirayan (Part)	I			
	Morappur	Kesarguli	I			

Year.	Name of series.	Name of reserved forest.	Coupe number.	Area in acres.	Revenue realised in rupees.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Dharmapuri Range—cont.				
1935–36	Panjapalli	Marandahalli Extension (Part)	I	2,006	185	
	Marandahalli	Marandahalli Extension (Part)	I	3,332	425	
	Galligattam	Galligattam (Part)	I	706	345	
	Morappur	Kesarguli	I	3,566	680	
	Guttirayan	Guttirayan (Part)	I	3,070	892	
1936–37	Panjapalli	Marandahalli Extension (Part)	II	1,683	200	
	Marandahalli	Marandahalli (Part)	II	2,785	400	
	Galligattam	Galligattam (Part)	II	3,581	320	
	Morappur	Morappur	II	4,644	..	Sale dropped.
	Guttirayan	Guttirayan	II	3,955	886	
1937–38	Panjapalli	Marandahalli Extension (Part)	III	2,152	325	
	Marandahalli	Do.	III	2,316	430	
	Galligattam	Galligattam (Part)	III	1,913 }	701	Two coupes were sold together.
	Morappur	Morappur and Tholavubetta Extension.	III	2,043 }		
	Guttirayan	Guttirayan (Part)	III	8,082	905	
1938–39	Panjapalli	Marandahalli Extension (Part)	I	2,006	220	
	Marandahalli	Marandahalli (Part)	I	3,332	285	
	Galligattam	Galligattam (Part)	I	786 }	650	Two coupes were sold together.
	Morappur	Kesarguli	I	3,566 }		
	Guttirayan	Guttirayan (Part)	I	3,070	710	
1939–40	Panjapalli	Marandahalli Extension (Part)	II	1,683 }	860	Two coupes were sold together.
			III	2,152 }		
	Marandahalli	Marandahalli and Extension (Parts).	II	2,785 }	820	Two coupes were sold together.
			III	2,316 }		
	Galligattam	Galligattam (Part)	II	3,581 }	730	Four coupes were sold together for 2 years from 1st April 1939 to 31st March 1941.
			III	1,913 }		
	Morappur	Morappur and Tholavubetta (Parts).	II	4,644 }	..	..
			III	2,043 }		
	Guttirayan	Guttirayan	II	3,955 }	900	Two coupes were sold together for 2 years.
			III	8,082 }		
1941–42	Guttirayan	Guttirayan (Part)	I	3,070	1,000	..
	Galligattam	Galligattam (Part)	I }	706 }	725	Two coupes were sold together.
	Morappur	Kesarguli	I }	3,566 }		
	Panjapalli	Marandahalli Extension (Part)	I	2,006	505	
1942–43	Guttirayan	Guttirayan and Wodapatti	II	3,955	290	
	Morappur	Morappur	II	4,644	212	
	Panjapalli	Marandahalli Extension (Part)	II	1,683	250	
	Galligattam	Galligattam (Part)	II	3,581	250	
1943–44	Morappur	Morappur and Tholavubetta (Part).	III	2,403	815	
	Guttirayan	Guttirayan	III	8,082	1,500	
1944–45	Galligattam	Galligattam (Part)	I	706	1,455	
	Morappur	Kesarguli	I	3,566	1,755	
	Guttirayan	Guttirayan (Part)	I	3,070	2,565	

1945–46	Galligattam	Galligattam (Part)	II	3,581	1,055	
	Morappur	Morappur	II	4,644	1,000	
	Guttirayan	Guttirayan and Wodapatti ..	II	3,955	..	Sale dropped.
1946–47	Morappur	Morappur and Tholavubetta Extension.	III	2,043	1,175	
	Guttirayan	Guttirayan	III	8,082	5,000	
1947–48	Morappur	Kesarguli	I	3,566	855	
	Guttirayan	Guttirayan (Part)	I	3,070	8,525	
1948–49	Morappur	Morappur	II	4,644	3,090	
	Guttirayan	Guttirayan and Wodapatti ..	II	3,955	13,020	
		Anchetti Range.				
1934–35	Anchetti	Anchetti (Part)	I	1,440	475	
	Billigundlu	Billigundlu (Part)	I	1,920	600	Two coupes were sold together.
	Natrapalayam	Natrapalayam	I	2,400	..	
	Urigam	Urigam and Taggati (Parts) ..	I	2,272		
	Taggati Bamboo	....	I	1,760		
	Urigam	Urigam (Part)	III	3,712	..	Not sold. Further sale dropped.
	Taggati Bamboo	....	II	2,000		
	Do.	....	III	2,368		
1935–36	Anchetti	Anchetti (Part)	I	5,024	605	
	Urigam	Urigam and Taggati (Parts) ..	I	2,497		
	Bilikal	Urigam (Part)	I	2,008	..	Sale dropped.
	Ubrani	Ubrani (Part)	I	3,296		
	Biligundlu	Biligundlu (Part)	I	4,646	375	
	Natrapalayam (Village Section) ..	....	I	2,589	210	
1936–37	Anchetti	Anchetti (Part)	II	1,810	611	
	Urigam	Urigam and Taggati (Parts) ..	II	2,696	60	
	Ubrani	Ubrani (Part)	II	1,770	25	
	Biligundlu	Biligundlu and Natrapalayam (Parts).	II	8,620	335	
	Natrapalayam	(Unreserve)	II	435	151	
	Bilikal	Urigam and Bilikal (Parts)	II	2,352	..	Sale dropped.
1937–38	Anchetti	Anchetti (Part)	III	2,720	900	
	Urigam	Urigam (Part)	III	2,436	52	
	Bilikal	Bilikal (Part)	III	1,506	40	
	Biligundlu	Natrapalayam (Part)	III	2,693	200	
	Natrapalayam (Village Section) ..	....	III	600	105	
	Ubrani	Ubrani (Part)	III	2,101	..	Ordered to remain unsold.
1938–39	Anchetti	Anchetti (Part)	I	5,024	610	
	Urigam	Urigam and Taggati (Parts) ..	I	2,497	..	Sale dropped.
	Ubrani	Ubrani (Part)	I	3,296	..	
	Bilikal	Urigam (Part)	I	2,008	50	
	Biligundlu	Biligundlu (Part)	I	4,664	275	
	Natrapalayam (Village Section) ..	....	I	2,589	110	

Year.	*Name of series.*	*Name of reserved forest.*	*Coupe number.*	*Area in acres.*	*Revenue realized in rupees.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Anchetti Range—cont.				
1939–40	Anchetti	....	II	1,810	1,000	Two coupes were sold together for two years from 1st April 1939 to 31st March 1941.
			III	2,720		
	Urigam	....	II	2,696	60	
	Bilikal	....	II	2,352	..	Sale dropped.
			III	1,506		
	Ubrani	....	II	1,770	195	Two coupes were sold together for two years.
			III	2,101		
	Biligundlu	....	II	8,620	300	
			III	2,673		
	Natrapalayam (Village Section)	....	II	435	..	Sale dropped.
			III	600		
1940–41	Natrapalayam (Village Section)	....	III	600	95	
	Bilikal	Bilikal (Part)	III	1,506	35	
1941–42	Anchetti	Anchetti (Part)	I	5,024	1,500	
	Bilikai	Urigam (Part)	I	2,008	..	Sale dropped.
	Ubrani	Ubrani (Part)	I	3,296	155	
	Biligundlu	Biligundlu (Part)	I	4,646	655	
	Natrapalayam (Village Section)	....	I	2,859	300	
	Urigam	Urigam and Taggati (Parts)	I	2,497	..	Sale dropped.
1942–43	Anchetti	....	II	1,810	411	
	Urigam	....	II	2,696	..	Sale dropped.
	Bilikal	....	II	2,352	40	
	Ubrani	....	II	1,770	343	
	Biligundlu	....	II	8,620	155	
	Natrapalayam	....	II			
	Natrapalayam (Village Section)	....	II	435	50	
1943–44	Anchetti	Anchetti (Part)	III	2,720	2,495	
	Urigam	Urigam (Part)	III	2,436	110	
	Bilikal	Bilikal (Part)	III	1,506	75	
	Ubrani	Ubrani (Part)	III	2,101	155	
	Biligundlu	Natrapalayam (Part)	III	2,673	476	
	Natrapalayam (Village Section)	....	III	606	106	
1944–45	Anchetti	Anchetti (Part)	I	5,024	6,000	
	Urigam	Urigam and Taggati (Parts)	I	2,497	120	
	Bilikal	Bilikal (Part)	I	2,008	375	
	Ubrani	Ubrani (Part)	I	3,296	480	
	Biligundlu	Biligundlu (Part)	I	4,646	2,800	
	Natrapalayam (Village Section)	....	I	2,859	450	

1945–46	Anchetti	Anchetti (Part)	II	1,810	2,505	
	Urigam	Urigam (Part)	II	2,696	815	
	Bilikal	Urigam and Bilikal (Parts)	II	2,352	400	
	Ubrani	Ubrani (Part)	II	1,770	345	
	Biligundlu	Biligundlu and Natrapalayam (Parts).	II	8,620	1,205	
	Natrapalayam (Village Section)	....	II	435	205	
1946–47	Anchetti	Anchetti (Part)	III	2,720	2,950	
	Urigam	Urigam (Part)	III	2,436	375	
	Bilikal	Bilikal (Part)	III	1,506	900	
	Ubrani	Ubrani (Part)	III	2,101	200	
	Biligundlu	Natrapalayam (Part)	III	2,673	475	
	Natrapalayam (Village Section)	....	III	606	425	
1947–48	Anchetti	Anchetti (Part)	I	5,024 }	1,500	Two coupes were sold together.
	Urigam	Urigam and Taggati (Parts)	I	2,497 }		
	Bilikal	Bilikal (Part)	I	2,008	1,050	
	Ubrani	Ubrani (Part)	I	3,296	630	
	Biligundlu	Biligundlu (Part)	I	4,646	5,010	
	Natrapalayam (Village Section)		I	2,859	855	
1948–49	Anchetti	Anchetti (Part)	II	1,810	1,860	
	Urigam	Urigam (Part)	II	2,696	890	
	Bilikal	Urigam and Bilikal (Parts)	II	..	..	Not sold.
	Ubrani	Ubrani (part)	II	1,770	1,000	
	Biligundlu	Biligundlu and Natrapalayam (Parts).	II	8,620	2,825	
	Natrapalayam (Village Section)	....	II	425	265	
		Krishnagiri Range.				
1941–42	Marandahalli	Marandahalli (Part)	I	3,332	200	
1942–43	Do.	Do.	II	2,785	200	
1943–44	Panjapalli	Marandahalli Extension (Part)	III	2,152	567	
1944–45	Do.	Do.	I	2,006	1,000	
	Marandahalli	Marandahalli (Part)	I	3,332	580	
1945–46	Do.	Do.	II	2,785	455	
1946–47	Do.	Do.	III	2,316	850	
	Panjapalli	Marandahalli Extension (Part)	III	2,152	1,350	
	Galligattam	Galligattam (Part)	III	1,913	650	
1947–48	Panjapalli	Marandhahalli Extension (Part)	I	2,006	1,055	
	Marandahalli	Marandahalli (Part)	I	3,332	500	
	Galligattam	Galligattam (Part)	I	706	610	
1948–49	Panjapalli	Marandahalli Extension (Part)	II	1,688	1,300	
	Marandahalli	Marandahalli (Part)	II	2,785	705	
	Galligattam	Galligattam (Part)	II	3,581	2,680	

Statement showing the average prices per ton fetched for different classes of sandalwood at Tirupattur from 1933–34 *to* 1947–48.

N.B.—The Sandalwood from Salem North are sent to Tirupattur (Vellore division) for sale.

Serial number.	*Name of class.*	1933–34.	1934–35.	1935–36.	1936–37. *Tender.*	1936–37. *December.*	1937–38. *Tender.*	1937–38. *December.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	V. Ghatbadla Special	..	..	..	..	..	..	..
2	V. Ghatbadla	1,029	869	845	795	720	693	719
3	VI. Bagardad	1,100	885	853	798	680	651	753
4	VII. Roots, I Class	990	790	805	920	815	725	790
5	VIII. Roots, II Class	1,070	803	838	920	782	777	803
6	IX. Roots, III Class	1,102	818	831	920	884	837	856
7	X. Jajpokal, I Class	894	783	755	735	659	608	640
8	XI. Jajpokal, II Class	925	765	756	725	633	604	629
9	XII. Ainbagar	933	778	765	715	604	619	622
10	XIII. Cheria	901	745	730	701	560	552	555
11	XIV. Ainchilta	910	600	625	656	503	525	520
12	XV. Hatrichilta	..	..	..	..	..	..	..
13	XVI. Milvachilta	547	405	403	476	355	402	362
14	XVII Basalabukni	494	324	321	424	282	348	311
15	XVIII. Saw dust	850	805	660	500	450	511	470
16	Charredwood	..	..	..	..	..	..	..

Serial number.	*Name of class.*	1938–39. *Tender.*	1938–39. *December.*	1939–40. *July.*	1939–40. *December.*	1940–41. *July.*	1940–41. *December.*
		(10)	(11)	(12)	(13)	(14)	(15)
1	V. Ghatabadla Special	..	..	..	..	..	..
2	V. Ghatbadla	635	696	630	664	..	532
3	VI. Bagardad	620	657	621	692	670	705
4	VII. Roots, I Class	..	703	..	729	..	680
5	VIII. Roots, II Class	..	729	..	810	..	812
6	IX. Roots, III Class	..	765	..	844	..	886
7	X. Jajpokal, I Class	552	583	540	590	514	584
8	XI. Jajpokal, II Class	580	580	..	575	501	626
9	XII. Ainbagar	590	585	..	582	..	639
10	XIII. Cheria	505	585	504	585	..	608
11	XIV. Ainchitla	504	530	504	540	500	567
12	XV. Hatrichilta	..	..	..	510	..	505
13	XVI. Milvachilta	368	379	..	417	362	458
14	XVII. Basalabukni	324	359	306	391	334	428
15	XVIII. Saw dust	401	403	..	430	..	465
16	Charred wood	..	555	..	660	..	620

Serial number.	*Name of class.*	1941–42. *July.*	1941–42. *December.*	1942–43. *July.*	1942–43. *December.*	1943–44. *July.*	1943–44. *December.*
		(16)	(17)	(18)	(19)	(20)	(21)
1	V. Ghatbadla Special	765	910	710	630	..	1,105
2	V. Ghatbadla	861	868	687	684	677	1,531
3	VI. Bagardad	914	884	698	689	693	1,591
4	VII. Roots, I Class	1,023	976	785	784	800	1,863
5	VIII. Roots, Class II	1,132	1,066	842	827	841	1,959
6	IX. Roots, III Class	1,201	1,131	887	905	921	2,035
7	X. Jajpokal I Class	898	845	646	675	688	1,595
8	XI. Jajpokal, II Class	893	825	648	675	700	1,617
9	XII. Ainbagar	893	823	675	682	705	1,628
10	XIII. Cheria	870	830	620	655	680	1,575
11	XIV. Ainchilta	879	785	670	620	655	1,420
12	XV. Hatrichilta	..	705	..	..	..	..
13	XVI. Milvachilta	679	619	424	415	445	1,036
14	XVII. Basalabukni	607	491	369	389	420	991
15	XVIII. Saw dust	600	460	430	570	550	1,450
16	Charred wood	885	760	655	680	740	1,510

Serial number.	*Name of class.*	1944–45. *July.*	1944–45. *December.*	1945–46. *July.*	1945–46. *December.*	1946–47. *July.*	1946–47. *December.*	1947–48. *July.*	1947–48. *December.*
		(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
1	V. Ghatbadla Special	2,030	2,365	2,600	2,605	4,600	6,003	..	3,457
2	V. Ghatbadla	2,164	2,309	2,399	2,746	4,937	5,076	..	2,498
3	VI. Bagardad	2,162	2,379	2,400	2,649	5,197	5,044	..	2,359
4	VII. Roots, I Class	2,337	2,485	2,472	2,912	4,916	5,173	..	2,798
5	VIII. Roots, II Class	2,407	2,558	2,592	2,982	5,160	5,255	..	2,882
6	IX. Roots, III Class	2,502	2,662	2,785	3,108	5,406	5,405	..	2,980
7	X. Jajpokal, I Class	1,908	2,210	2,312	2,520	4,913	4,616	..	1,949
8	XI. Jajpokal, II Class	1,851	2,203	2,326	2,498	4,870	4,292	..	1,757
9	XII. Ainbagar	1,865	2,133	2,295	2,495	4,816	4,252	..	1,685
10	XIII. Cheria	1,805	2,010	2,200	2,405	4,700	4,200	..	1,705
11	XIV. Ainchilta	1,675	1,955	2,180	2,390	4,500	4,100	..	1,608
12	XV. Hatrichilta	..	..	..	..	..	..	..	..
13	XVI. Milvachilta	1,250	1,468	1,642	1,935	3,436	3,370	..	1,135
14	XVII. Basalabukani	1,191	1,420	1,592	1,880	3,617	3,233	..	1,005
15	XVIII. Saw dust	1,800	1,905	2,510	2,540	4,890	4,205	..	1,505
16	Charred wood	2,000	2,100	..	2,615	4,610	4,400	..	1,705

CHAPTER IV—STAFF AND LABOUR SUPPLY.

SECTION 1—STAFF.

67. The existing establishment of the division is shown in the following statement :—

Description of staff.	*Name of post.*	*Rank.*	*Sanctioned strength.*	*Actual strength.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
1 Administrative ..	District Forest Officer.	Assistant Conservator of Forests.	1	1	At present an Assistant Conservator of Forests is in charge of the division.
2 Executive ..	Range Officers ..	Rangers	5	5	On scale of pay of Rs. 100—10—150 efficiency bar—20—250.
	Foresters	Foresters	23	23	On scale of pay of Rs. 50—3—65—2—85. Post of two Foresters retrenched with effect from 9th and 12th May 1949—Chief Conservator's No. 2423/49-2.
3 Protective ..	Beat guards ..	Forest guards ..	47	47	On scale of pay of Rs. 20—½—30.
	Panchayat beat guard.	Do. ..	1	1	Do.
	Special duty guards.	Do. ..	7	7	Do.
4 Protective (temporary establishment).	Beat watchers ..	Watchers on Rs. 9 per mensem.	43	43	
	Panchayat watcher.	Do.	1	1	
	Beat watchers ..	Watchers on Rs. 10 per mensem.	11	11	
	Bungalow watchers.	Watchers on Rs. 4 per mensem.	3	3	
5 Ministerial ..	Head clerk ..	Upper Division clerk.	1	1	On scale of pay of Rs. 80—3—95—5—110.
	Accountant ..	Do.	1	1	Do.
	Routine clerks ..	Lower Division clerk.	5	5	On scale of pay of Rs. 45—3—60—2—90.
	Typist	Do.	1	1	Do.
	Draftsman	Do.	1	1	On scale of pay of Rs. 55—3—100.
	Range clerks ..	Do.	5	5	On scale of pay of Rs. 45—3—60—2—90.
	Range clerks (temporary).	Do.	2	2	On scale of pay of Rs. 45—3—60—2—90 (for Denkanikota East and Dharmapuri Ranges).
6 Peons	District Forest Officer's peons.	....	4	4	On scale of pay of Rs. 16—½—25.
	Range peons ..	....	5	5	Do.
	Range peons (temporary).	....	3	3	On scale of pay of Rs. 16—½—25 (for Anchetti, Denkanikota East and West Ranges).
7 Menials	Office watchers ..	....	3	3	(One for District Forest Officer's office, one for Krishnagiri and one for Dharmapuri). Pay Rs. 9.

SECTION 2—LABOUR SUPPLY.

68. The labour required for sandal extraction and other departmental operations in the division is drawn from the coolie classes of the villages adjoining the work spots. For unskilled labour, is recruited from the Lingayat, Vakkaliga, Muhammadan, Adi-Dravida and other communities. There is generally no dearth of labour, except during the season when the agricultural crops are sown or harvested, that is, during the months of May-June and December-January. The assignment of lands at Uttumalai near Hogenakal to men from Mettur in exchange for lands submerged as a consequence of the building of the Mettur Dam has resulted in the development of a potential labour force in an area where labour was scarce. But these men make unwilling and unsatisfactory coolies. Mention may be made of the availability of skilled axemen in a hamlet called Matam near Pennagaram ;

for road work and earth work, skilled coolies called Woddars may, as usual, be recruited from Denkanikota, Kottur, Salivaram, Thalli, Anchetti, Natrapalayam and villages adjoining Pennagaram.

69. *Labour settlements.*—The subjoined statement shows the existing forest settlements in Anchetti range :—

Range.	*Nature of settlement.*	*Area in acres.*	*Name of settlement.*	*Number of families.*	*Name of reserve.*
(1)	(2)	(3)	(4)	(5)	(6)
1 Anchetti ..	Forest lease with assessment of Re. 1–2–0 per acre.	11·75	Wodapatti	1	Wodapatti reserved forest.
2 Do. ..	Forest lease free of assessment.	20·89	Biligundlu	4	Biligundlu reserved forest.
3 Do. ..	Do.	8·16	Do.	3	Biligundlu and Natrapalayam.
4 Do. ..	Do.	13·48	Natrapalayam ..	3	Natrapalayam reserved forest.

70. At the time of the preparation of Sri C. R Ranganathan's Working Plan there was another settlement known as Beedamarathupatti settlement (Irulars) in Guttirayan reserved forest of Dharmapuri range. There were thirteen families consisting of 81 members in that settlement, who were given 29·47 acres of land for cultivation. The number gradually dwindled, the Irulars having gone away to some plateau villages and, across the Cauvery, to Kollegal. At present there are no Irulars in the Beedamarathupatti settlement.

CHAPTER V.—PAST SYSTEMS OF MANAGEMENT.

SECTION 1—GENERAL HISTORY OF THE FOREST.

71. The areas that now compose the North Salem Division came into the hands of the English partly by the treaty of peace with Tipu Sultan in 1792 and partly by the Partition Treaty of Mysore in 1799. The greater part of the areas now included in Dharmapuri range were among those ceded under the earlier treaty, while the Balaghat (Hosur taluk) was added to the previous cession in 1799.

72. It is well known that Tipu appreciated the value of sandal forests. He had an armed guard of 200 Nayars stationed at Denkanikota to protect the adjoining sandal jungles and theft of sandal trees was visited with savage punishment, the hands of the unfortunate offender being cut off. In Tipu's time sandal was a royal tree and no private ownership of trees of that species was recognized. The disputes arising out of the private ownership of sandal are the product of sheltered times.

73. The following account of the history of forest conservancy in Salem district is extracted from the Madras District Gazetteer compiled by Mr. F. J. Richards :—

" Forest conservancy in Salem district may be said to begin with the advent of the Madras Railway towards the end of the sixth decade of the 19th century. Attempts had already been made by the local authorities to restrict the wholesale clearance of forest growth for purposes of cultivation. The profits to be made by the exploitation of forest products had attracted the notice of Government. With the construction of the railway came a frantic demand for sleepers. An attempt was made to control the supply, and by the year 1860–61 a complete establishment was organized and a set of rules was sanctioned. But the establishment, which consisted of an Assistant Conservator, an Overseer and 12 peons, was too small and too late to prevent a devastation from which the district has not been yet recovered.

For the construction of the Madras Railway the Salem forests were recklessly denuded. In the year 1859–60 seigniorage fees amounting to nearly Rs. 23,500 were realized on sleepers alone, the number of sleepers supplied within the year being 245,743. So great was the demand that trees could not be marked fast enough and felling was uncontrolled. These sleepers were not sawn but added, a process involving immense waste of material, for a log however large would only suffice for one sleeper. According to a report of 1863, old stumps show that there used to be good-sized teak on hill forests but now there is not much left. Nor were the greedy contractors content with destroying all the teak. Fine satinwood forests were entirely wiped out by them, and before the new Forest Department could make itself felt, irreparable mischief was done. The next 25 years were years of experiment and much bitter experience was gained. Experiments were made in nurseries and plantations, in the merits and demerits of the licence and voucher system, in departmental felling and in the exploitation of railway fuel, in exploration and in the settlement of boundary disputes, in the construction of forest roads, in the formation of reserves and in surmounting the difficuties arising out of the short comings of the law.

In 1861–62 there was wholesale theft of timber along the Cauvery banks, the stolen wood being floated downstream to Srirangam on bamboo rafts. In 1865 railway contractors took to robbing the Government forests of timber under cover of mitta leases. In 1865 the seigniorage of 12 annas for 48 large bamboos and 6 pies per bundle of small bamboos, imposed in 1861, was removed and such enormous quantities were exported into Mysore in consequence, that the seigniorage had to be reintroduced in the following year. In 1866–67 hundreds of thousands of trees were illicitly felled by cattle drivers, and Government were helpless because the magistracy refused to convict for theft. In 1870 the Conservator writes 'Government have only to look at the amount of timber taken free out of the Salem jungles alone to see that no forests could possibly stand a drain of this nature.' A rather dispiriting comment on ten years' work. In the following year it was decided to place the Forest Department under the direct control of the Collector, who hitherto had managed the Jungle Conservancy Department with the aid of local cesses independently. This change was brought into force on 1st October 1872 and continued for a decade with rather more encouraging results. By 1880 no less than 222 isolated topes had been set apart as jungle conservancy topes and 12 reserves had been surveyed and demarcated for the supply of fuel to the Madras Railway and walled or fenced at some cost.

Scientific conservancy begins with the passing of the Madras Forest Act V of 1882. In the first few years subsequent to the passing of the Act, the policy of the Government towards reservation changed several times as knowledge of the working of the Act improved. Thus at first it was intended to set aside certain areas outside the reserved forests, as village forests. It was soon found that the village officers could not be trusted to manage these areas for the benefit of the village community in general, and the idea of village forests was abandoned, the Government reserves being extended so as to include the areas originally left out for village forests. The result was that in some places the reserves were brought so close to cultivated lands that there was insufficient ground left available for extension of cultivation, and the sudden absorption of all the land fit for pasturing the village herds into reserved forests in which free pasture was not allowed, caused so much ill-feeling that orders were issued to put back reserved boundaries so as to leave outside them sufficient waste land for the extension of cultivation and the exercise of ordinary communal privileges. The result of these changes of policy was to delay the final selection and settlement of Government reserve and to create at each change of policy a fresh set of boundary lines. From 1890 till 1893 a special party from the Survey of India was engaged in surveying the reserved forests, and many of the maps bear evidence of the changes then taking place, as they show boundary lines and reserves which have since been abandoned. The first notifications of reservation were published in 1886, the included area being 550,614."

74. *Administrative history of the division.*—After the constitution of the Forest Department, all forest areas in the Salem district were formed into one division, called the Salem division, and placed in the charge of a District Forest Officer. This arrangement continued till the close of the last century, although the Board had made proposals as far back as 1888 (approved in G.O. No. 475, Revenue, dated 10th July 1888) that the district should ultimately be divided into two forest charges. The need for this division became urgent in 1902 and in G.O. No. 419, Revenue, dated 13th May 1902, two independent forest charges, designated the North and South Salem divisions were sanctioned. The newly created North Salem division was composed of (1) Hosur range comprising the taluk of Hosur, (2) Tirupattur range comprising Krishnagiri and Tirupattur taluks, and (3) Dharmapuri range comprising Dharmapuri and a portion of Uttankarai taluks. In 1907, the Dharmapuri range was subdivided into Dharmapuri and Salem West ranges. At this date the division was thus composed of the Hosur, Tirupattur, Dharmapuri and Salem West ranges (vide G.O. No. 1421, Revenue, dated 7th June 1907). The Tirupattur range was subdivided in 1911 into two ranges, namely Tiruppattur and Krishnagiri ranges, and the former was transferred to the newly formed West Vellore division. In 1913 two new ranges, the Cauvery and Anchetti ranges, were created by the reformation of the Hosur, Salem West and Dharmapuri ranges, so that at this date the division consisted of six ranges, namely, Hosur, Dharmapuri, Salem West, Anchetti, Cauvery and Krishnagiri ranges. The name of the Hosur range appears at this time to have been changed to Denkanikota. In the alterations and readjustments that followed the abolition of the Tiruchirappalli and South Arcot divisions (sanctioned in G.O. No. 1790, Revenue, dated 22nd September 1919), Salem West and Cauvery ranges were transferred to the newly formed Central Salem division and Krishnagiri range to West Vellore division. This alteration was given effect to in 1921 and North Salem was left with only three ranges, namely, Denkanikota, Anchetti and Dharmapuri ranges. Denkanikota range was subdivided in 1926 into Denkanikota East and Denkanikota West ranges (G.O. No. 185, Revenue, dated 6th February 1926). In the redistribution of areas consequent on the transfer of certain forests to Panchayat management in 1926, Krishnagiri range reverted to North Salem division with effect from 1st July 1926. Thus at this date the division consisted of five ranges, namely, Denkanikota East, Denkanikota West, Dharmapuri, Anchetti and Krishnagiri. Again in 1933 owing to the

bifurcation of Vellore division into two divisions, Krishnagiri range was transferred to West Vellore division on 1st June 1933. The ranges were reformed, when the Central Salem division was abolished resulting in the transfer of the reserves of the Cauvery range to the North Salem on 1st April 1939. The Krishnagiri range also was transferred from the Vellore West division on 1st April 1939. At present the North Salem division comprises of Denkanikota East, Denkanikota West, Anchetti, Dharmapuri and Krishnagiri ranges.

SECTION 2—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

75. *General.*—The division is essentially a sandal tract and its most important activity has always been the production of sandalwood. In addition to sandalwood, it produces bamboos, firewood, minor produce of various kinds of which most valuable is tamarind, and provides grazing for large numbers of cattle. No extensive planting work has ever been undertaken and natural regeneration has been depended on for maintaining the productivity of the forest. The past management of the division has been one of continued exploitation and the methods of management adopted for the various kinds of produce are reviewed in the following paragraphs.

76. *Position as regards working plans.*—A working plan for the sandal areas in Hosur taluk comprising the Denkanikota and Anchetti ranges, entitled the Hosur Sandalwood Working Plan, was prepared by Mr. C. C. Wilson in 1917 and sanctioned by the Board of Revenue in its Resolution—Forest No. 31, dated 7th March 1917. This plan was concerned with the exploitation of sandalwood only in the reserves and unreserves of the ranges named above. It did not cover Dharmapuri range. A separate working plan for that range had been drawn up by Mr. C. B. Dawson in 1910, but it was not approved by the Collector. In 1913 this plan was revised by Mr. J. Sadasiva Iyer under Mr. McCarthy's instructions, but was not sanctioned by the Board pending the classification of reserves than being done. The Board ordered that the plan should be revised by Mr. Wilson, but this was, however, not done, as Mr. Wilson left India soon after the completion of the Hosur Working Plan on war service. A working scheme for the sandal tracts in Dharmapuri range was prepared by Mr. Hart in 1925 and was subsequently revised by Mitchell in 1929. The prescriptions of the Hosur Sandalwood Working Plan were suspended in 1923 on account of the spread of spike.

77. A working scheme for bamboo areas was prepared by Mr. E. K. Krishnan in 1931 was followed in practice, although it had not been sanctioned. The exploitation of fuel and other items of produce was not governed by any working plans or schemes.

78. The forests of Thoppur and Parigam reserves had been worked irregularly till a tantative scheme for working these forests was sanctioned—vide Conservator's R. Dis. No. 307/23, dated 26th April 1923. Prior to 1923 nine coupes of an average annual extent of 190 acres, in Parigam B reserve and eight coupes of about an average of 55 acres in Thoppur reserve had already been worked. After the sanction of the scheme of 1923, 12 coupes in Thoppur south series and 10 in Thoppur north series had been worked. Besides these, six experimental coupes, three in each of the new series of Parigam B reserve were sold from 1931–32 to 1933–34.

79. In 1930, Mr. V. S. Kuppuswamy, prepared a working plan for these forests for the period 1930–31 to 1939–40 which was sanctioned by the Chief Conservator of Forests in his Proceedings No. 223, Press, dated 26th April 1938. He fixed a rotation of 30 years and prescribed two felling series. The working plan expired in 1940. The working of coupes, however, continued even after the expiry of the period and, up to now, 13 coupes in Thoppur series and 13 coupes in Parigam B series have been worked.

80. The reserves round about Pachur were worked from 1885 to 1888 when the method of coppice with standards was introduced. The rotation fixed for simple coppice system was 32 years. The objects were to meet the demand of the Madras Railway Company for fuel and to supply small timber to the neighbouring population. Coupes were worked departmentally till 1908. Subsequently coupes were leased out to contractors but, with decreasing demand by the Railways, the sale of coupes steadily declined. In 1924, Mr. D. L. Sathe drew up another working plan (sanctioned—vide Chief Conservator's Proceedings No. 316, Press, dated 10th November 1924) and prescribed fuel series in the Varatanapalli, Maharajagadai and Nerlapalli reserves. The rotation was fixed as 40 years, but in 1933 it was increased to 50 years—vide Chief Conservator's Proceedings No. 367, dated 17th August 1933.

81. The above plan was revised by Mr. A. R. Brand, in 1936, and it was sanctioned—vide Chief Conservator's Proceedings No. 233, Press, dated 9th May 1939. He prescribed five regular series and one reserve series on a rotation of 40 years.

82. *Exploitation of sandalwood.*—The introduction of the Hosur Sandalwood Working Plan in 1917–18 marked a definite epoch in the management of sandal forests on the Hosur plateau. Prior to 1917 the exploitation of sandal was of a random and unsystematic

character, the annual outturn being but a fraction of the possibility of the forest. Mister Wilson's remarks on past management may be quoted here. He wrote in his working plan, "Since 1901, the sandal is supposed to have been extracted in accordance with the rules laid down in the 'Standing Order on Sandalwood Fellings' drawn up by Mr. Rama Rao and circulated under Mr. Lodge's orders to all rangers in charge of sandalwood areas. The forests have not been worked to a degree at all approaching their capacity. In fact nearly all the sandal areas contain a number of dead logs of various sizes lying about, which have been cleaned of all sapwood by white ants and which contain only pure scented heartwood. This state of things is in no way surprising, as there has been no proper working plan, and the collection, extraction and cleaning has all been done by the ordinary forest staff. Under the 'Standing Order' referred to, all trees of 30 inches in girth and above were uprooted, billetted, rough cleaned, marked, measured and weighed in the forest and were exported to the sale depot before final cleaning. This method of working was adhered to until in 1913 the District Forest Officer, Mr. McCarthy, stopped all extraction of sandal with the exception of dead trees, pending the preparation of a proper working plan."

83. Local enquiries made by Mr. Wilson showed that early in the later half of the nineteenth century, in the time of Campbell Walker, a very large number of sandal trees had been extracted. The trees were of very large size and all those that contained heartwood were said to have been extracted in a period of ten years. When the forest was thus exhausted, the operations ceased and were not resumed for about twenty years.

84. Mr. Wilson's working plan of 1917 dealt with the management of sandal in the two ranges of Denkanikota and Anchetti, as then constituted. Those two ranges were divided into three ranges in 1926. The Javalagiri reserve was, under the orders of the Conservator, excluded from the purview of the working plan owing to the outbreak of epidemic spike in that reserve in 1913. The exclusion of this reserve for a reason which, if anything, should have commended the reserve to the special attention of the Working Plan Officer, seems very strange. The actual area covered by the working plan was 174,891 acres. The allocation of coupes and the forecast of yield were based on the detailed enumeration, in one-inch classes, of sandal trees over 45,166 acres, and on an accurate stockmap of the sandal forests over the whole working plan area. The working plan divided the forests dealt with into the following nine felling series, each of which consisted of six annual coupes :—

	ACS.
A. Aiyur Felling Series ..	10,680
B. Tholavubetta Felling Series ..	7,258
C. Gulhatti East Felling Series ..	3,497
D. Gulhatti West Felling Series	5,435
E. Manchi Felling Series	8,605
F. Pane West Felling Series	9,104
G. Thalli Felling Series ..	10,662
H. Anchetti Felling Series	9,609
I. Urigam Felling Series ..	10,075
Total ..	74,925

85. The working was regulated entirely by area on a felling cycle of six years, and a period of 18 years including three felling cycles wasadopted as the period of the working plan. The plan prescribed the extraction of dead trees during the first cycle and of dead as well dying trees during the second and third cycles. Dying trees were defined as those not expected to survive until the next felling cycle. Girdling of dying trees was prescribed on an experimental scale in Gulhatti East Series in the second and subsequent cycles in the expectation that the process of girdling would stimulate increased production of heartwood, minimize the development of cracks in the heartwood and, finally, promote reproduction by root-suckers. The working plan was suspended before it was due to enter on its second cycle and the operations allotted to the second and subsequent cycles were, therefore, never carried out.

86. The working plan stressed the need for regular tending of the crop and laid down detailed instructions for the right conduct of tending operations. It prescribed that, after the fellings were completed in every coupe, a cleaning should be made under all especially promising mother trees and the soil scratched up around them ; and that *small* blanks in the coupes should be regenerated by dibbling sandal seeds under bushes. The tending operations were allotted to the year after felling and the regeneration operations to the year of felling after its conclusion.

87. The Hosur Sandalwood Working Plan (as also the very similar working plan for the Javadis) basing itself as it did on an objective study of the growing stock and paying equal attention to the requirements of exploitation an silviculture marked a great advance

on the rough and ready exploitation schemes that had earlier passed for sandal working plans in North Salem and elsewhere. The plan was, however, fated to be a short-lived one and was soon overthrown by the rapid spread of spike. The working plan had adopted long period of 18 years as its period and laid down varied prescriptions to be brought into effect in the second cycle. It vizualized a progressively improving growing stock as a result of regular working and predicted a greatly increased outturn at the end of the felling period. The increased outturn had been realized, but not the improvement. It need not be speculated on what these emergency provisions might have been, but seems certain that the omission to foresee the almost inevitable spread of spike was largely responsible for the abrogation of a carefully made plan within four years of its introduction.

88. During 1917–18, 1918–19 and 1919–20, the major provisions of the plan relating to exploitation were closely followed, coupes I, II and III being worked annually in succession in all the series. In 1919–20, however, in addition to fellings of dead trees in coupes III of the several felling series, unreserves adjoining the coupes, but not included in the working plan, were exploited for dead trees, and 219 spiked but living trees were extracted from coupes IV and V of Thalli series, under the Conservator's orders, in advance of the prescriptions of the plan. In 1920–21, not only was coupe IV worked for dead trees in all the series, but living spiked trees were extracted irrespective of coupes from the Tholavubetta, Thalli, Gulhatti and Aiyur reserves. In 1922–23, the prescriptions of the working plan were suspended under the orders of the Chief Conservator for the seven felling series in Denkanikota range owing to the general outbreak of spike and the consequent necessity for the concentration of the whole staff on the extraction of affected trees. The suspension was extended to all the nine felling series in 1923–24. The ordinary establishment of the division was unable to cope with the abnormal extraction of living spiked trees diffused over a vast area and a special additional establishment of ten foresters, five forest guards and five watchers was employed from 1st April 1925. The extraction of spiked trees over extensive but undefined areas was continued during 1925–26 and 1926–27. At the Conservator's Conference of 1927, it was resolved that, for the future, only actually dead trees should be extracted, whether occurring in spiked or unspiked areas. The removal of living spiked trees which was designed to arrest the spread of the disease had definitely failed of its purpose. A reversion was made to the prescriptions of the working plan in 1927–28, under the orders of the Conservator. It may be noted that the authority of the Conservator is not in reality sufficient to restore a plan suspended by the Chief Conservator. In 1927–28, coupes V of all the felling series were worked for dead trees. The special additional establishment sanctioned in 1925 was disbanded. During the next year, coupes VI of all the felling series were gone over for dead trees, but owing to the coupes having been heavily worked several times over in the recent past the extracted trees were found to be of small size and included a large proportion of sapwood trees. In 1929–30, again the fellings continued to be regulated by the working plan, coupe I of the various felling series being worked, except in Denkanikota West range where arrear fellings in coupes VI were undertaken. It was found no longer possible to adhere to the working plan coupes on account of the extreme irregularity of the 'spike' fellings in the past and the consequent scarcity of dead trees of reasonable size. A temporary working scheme to regulate extraction was introduced by Mr. Mitchell in 1930–31 with the sanction of the Conservator. Even this scheme was more or less completely abandoned in 1932–33 to make room for the extraction of trees in unreserves as ordered by the Chief Conservator.

89. The history of the tending and regeneration operations laid down in the working plan is very similar to that of the exploitation operations. During the few years in which the working plan was in force, the tending and regeneration regulations were followed with reasonable faithfulness. A change was, however, made at the very beginning in the chronology of these operations. The working plan prescribed that the regeneration works should be undertaken in the year of felling and the tending in the year following felling. The Conservator, rightly in our view, inverted with effect from 1918 the prescribed sequence of operations, directing the tending to be done in the year of felling and at the time of enumeration and postponing the regeneration to the year following. In 1919, he made himself responsible for yet another deviation in ordering that scratching of the soil under promising mother trees need not be undertaken. It does not appear that sanction by competent authority was obtained for these and other deviations from the plan. With the suspension of the working plan in 1922–23, all cultural operations were abandoned till 1928, when Mr. Mitchell made spasmodic efforts to revive interest in the artificial regeneration of sandal.

90. At the time of the preparation of the Hosur Sandalwood Working Plan, the pest lantana had already appeared in the division and taken possession of considerable areas in various reserves. The worst affected reserves were Gulhatti, Pane, Hulibanda and Thalli. The plan proposed to deal with this evil in two ways. It prescribed direct uprooting over some 2,526 acres, where lantana did not occur very densely. In the areas where it was

densely present, over an estimated area of 2,286, Mr. Wilson's intention was to get rid of the pest by means of podu cultivation and he proposed experiments to this end. Between 1917 and 1921, direct uprootal was carried out in several areas, but chiefly in the Thalli reserve. An area of 1,299 acres was so treated and a total sum of Rs. 2,111–8–3 was spent on the work. The proposed experiment in podu cultivation in dense lantana areas was apparently never done. The attempted eradication of lantana does not appear to have done any good. The lantana area in the Thalli reserve instead of diminishing as a result of uprootal is actually greater now than it was in 1917. Direct eradication measures, besides being prohibitively expensive, are utterly inadequate, unless organized simultaneously in all areas on a vast scale, as they leave out of account the probability of spread from external untreated areas, such as, for instance, unreserves or adjoining Mysore territory.

91. *Outturn of sandalwood.*—The Hosur Sandalwood Working Plan gives the following as the outturn realized during the period immediately prior to its introduction :—

YEAR.	TONS.	
1907–09	15·8	These figures relate to Denkanikota and Anchetti ranges. The outturn shown includes both heartwood and chips.
1908–09	17·5	
1909–10	17·4	
1910–11	30·6	
1911–12	15·0	
1912–13	14·9	
1913–14	17·1	
1914–15	15·8	
1915–16	18·9	

92. Mr. C. C. Wilson's working plan indicated probable yields that would be realized during the first, second and third cycles. The yield for the first cycle was based on the actual number of dead trees counted during enumeration, while that for the second and third cycles was calculated by means of a formula. An annual outturn of 18·7 tons during the first cycle and of 182·4 tons during the subsequent two cycles was thus indicated. The following statement shows the actual yields realized during the first five years of the first cycle, as compared with the working plan forecast :—

Felling series and coupe number.	*Year.*	*Actual outturn realized in*			*Working plan forecast in*		
		QRS.	LB.	OZ.	QRS.	LB.	OZ.
(1)	(2)		(3)			(4)	
Aiyur coupe I	1917–18 ..	1	0	1*	3	22	0
Do. II	1918–19 ..	94	24	2	52	24	0
Do. III	1919–20 ..	328	14	9	138	18	0
Do. IV	1920–21 ..	136	13	14	34	12	0
Do. V	1921–22 ..	95	27	15	103	18	0
Tholavubetta coupe I	1917–18 ..	1,043	23	13*	411	14	0
Do. II	1918–19 ..	1,479	2	14	618	6	0
Do. III	1919–20 ..	307	26	2	197	20	0
Do. IV	1920–21 ..	2,806	20	15½	301	6	0
Do. V	1921–22 ..	3,737	26	5	123	16	0
Gulhatti East coupe I	1917–18 ..	341	8	4*	58	18	0
Do. II	1918–19 ..	95	27	8	60	18	0
Do. III	1919–20 ..	106	13	13	153	6	0
Do. IV	1920–21 ..	485	1	2	213	14	0
Do. V	1921–22 ..	1,404	14	11	213	20	0
Gulhatti West coupe I	1917–18 ..	1,261	26	7*	243	10	0
Do. II	1918–19 ..	1,145	11	0	838	8	0
Do. III	1919–20 ..	505	8	3	373	2	0
Do. IV	1920–21 ..	518	22	9	550	22	0
Do. V	1921–22 ..	1,211	17	14	698	22	0
Manchi coupe I	1917–18 ..	346	8	2*	252	8	0
Do. II	1918–19 ..	220	23	5	94	24	0
Do. III	1919–20 ..	55	1	2	22	12	0
Do. IV	1920–21 ..	34	1	15	35	6	0
Do. V	1921–22 ..	852	24	4*	404	6	0
Pane West coupe I	1917–18 ..	24	19	8	36	10	0
Do. II	1918–19 ..	3	9	10	12	0	0
Do. III	1919–20 ..	15	14	7*	15	2	0
Do. IV	1920–21 ..	102	14	8	53	10	0
Do. V	1921–22 ..	239	27	6	†	†	†
Thalli coupe I	1917–18 ..	16	12	4*	0	4	0
Do. II	1918–19 ..	30	4	15	15	14	0
Do. III	1919–20 ..	335	12	2	306	26	0
Do. IV	1920–21 ..	77	5	0	95	2	0
Do. V	1921–22 ..	87	12	0	112	10	0

* Rough cleaned wood. † Yield not entered in working plan.

Felling series and coupe number. (1)	*Year.* (2)	*Actual outturn realized in* (3) QRS.	LB.	OZ.	*Working plan forecast in* (4) QRS.	LB.	OZ.
Anchetti coupe I	1917–18	95	8	6½*	31	10	0
Do. II	1918–19	411	0	0	142	4	0
Do. III	1919–20	55	14	0	12	24	0
Do. IV	1920–21	697	25	2	347	16	0
Do. V	1921–22	321	20	8	57	22	0
Urigam coupe I	1917–18	6	8	11*	9	20	0
Do. II	1918–19	20	0	0†	21	14	0
Do. III	1919–20	515	0	12	265	24	0
Do. IV	1920–21	409	13	8	137	24	0
Do. V	1921–22	427	2	14	184	18	0

93. It will be noted that the actual realization has substantially exceeded the anticipations of the working plan. The striking difference between the forecasts of annual outturn during the first and subsequent cycles is much too large to be explained solely by the fact that the plan provided for the extraction of dying trees in the second and third cycles. The true explanation seems to be that the plan based its forecast of outturn in the first cycle on the actual number of dead trees counted during enumeration and made no allowance for the trees that would die progressively from year to year. The forecast for the first cycle was therefore under estimate. Other factors, however, considerably influenced the actual outturn of the coupes. Of these the most important was the frenzied extraction of living spiked trees, wherever found. The working plan did not contemplate the removal of any but dead trees during the first cycle. A typical example of the drain to which the forest was subjected in consequence of these 'spike' fellings is furnished by Aiyur coupe V. According to the working plan, this compartment should have been worked in 1921–22 and 1927–28. Actually, it was worked in 1921–22, 1924–25, 1925–26, 1926–27 and 1927–28. The outturn realized was Qrs. 1,252, lb. 4 and oz. 10 which was nearly what the working plan anticipated for the entire Aiyur series during the second cycle.

94. On the aspect of calculation of the probable yield of sandalwood in the second and third cycles, Sri C. R. Ranganathan's working plan states as follows :—

"The possibility of the forest which will depend on the number of trees which may die from year to year cannot be estimated except on the basis of probability. The peculiarly unsettled conditions of the growing stock, due to the persistence of epidemic spike, renders the application of statistical laws, found to be valid in other tracts, of doubtful utility in North Salem. Any forecast of annual outturn based on statistical considerations is only too likely to be upset by a wave of spike. It is, however, necessary to give an indication of probable outturn, even if it be little better than a guess. On a consideration of past yields and with due regard to the number of trees in the growing stock and its condition, we think it probable that the annual yield during the first cycle will be 545 tons of rough-cleaned wood ; during the second and subsequent cycles the yield is likely to fall to 330 tons of rough-cleaned wood. These figures are approximate and are essentially based on conjecture and no special validity is claimed for them. As the annual exploitation is governed by area, the accurate fixing of the outturn is of no real moment."

95. The following statement shows the actual yeilds of sandalwood obtained during the second and third cycles :—

Felling series and coupe number. (1)	*Year.* (2)	*Actual outturn realized in* (3) QRS.	LB.	OZ.
Aiyur, IV	1922–23	No extraction.		
	1923–24	376	8	15
Nalkundi and Aiyur	1924–25	638	6	0
Aiyur, Nyamasandiram Agraharam, Sameri, Nalkundi and coupe IV.	1925–26	6,494	18	10
Nyamasandiram Agraharam, Sameri and Nalkundi and IV and V.	1926–27	4,161	2	10
Aiyur and Nyamasandiram Agraharam and V	1927–28	745	9	4
		240	11	0
Aiyur, VI	1928–29	420	21	10
Aiyur, I	1929–30	137	3	14
	1930–31	....		
Unreserves	1931–32	146	7	6
Aiyur, II	1932–33	1,265	21	0
	1933–34	....		
	1934–35	....		
Tholavubetta	1922–23	No extraction.		
Tholavubetta, IV, V and VI	1923–24	3,689	20	6

* Rough cleaned wood. † Approximate.

Felling series and coupe number. (1)	*Year.* (2)	*Actual outturn realized in.* QRS. (3)	LB.	OZ.
Tholavubetta, IV and V	1924–25	401	13	5
Do.	1925–26	1,046	18	4
Tholavubetta, III, IV and V	1926–27	4,012	16	10
Tholavubetta, V	1927–28	101	21	0
Tholavubetta, VI	1928–29	560	8	10
Tholavubetta, I	1929–30	657	17	2
	1930–31	648	26	3
	1931–32	Not worked owing to restriction of output.		
	1932–33	Do.		
Tholavubetta, II	1933–34	2,192	21	2
	1934–35	....		
Gulhatti, West	1922–23	Not worked.		
Gulhatti, West, VI	1923–24	21	23	0
	1924–25	Not worked.		
Do.	1925–26	1,674	24	0
Gulhatti, West, V and VI	1926–27	3,208	9	0
Gulhatti, West, V	1927–28	1,438	6	4
Gulhatti, West, VI	1928–29	1,927	14	13
Gulhatti, West, I	1929–30	1,179	4	15
	1930–31	1,992	16	2
	1931–32	Not worked.		
Maniyambadi unreserve	1932–33	284	15	0
Maniyambadi and Gummadahalli	1933–34	1,313	18	4
	1934–35	....		
Manchi	1922–23	Not worked.		
Manchi, IV and V	1923–24	96	4	9
Manchi, V	1924–25	88	20	0
Manchi, I and V	1925–26	1,458	15	0
	1926–27	Not worked.		
Manchi, V	1927–28	3,003	6	8
Manchi, VI	1928–29	1,164	3	12
Manchi, I Part	1929–30	1,697	13	14
	1930–31	1,407	20	6
Sivajamma	1931–32	34	1	5
	1932–33	Not worked.		
	1933–34	....		
	1934–35	....		
Pane, West	1922–23	Not worked.		
Pane, West, IV and VI	1923–24	28	16	0
	1924–25	516	15	12
	1925–26	992	22	8
	1926–27	244	12	12
Pane, West, V	1927–28	229	26	0
Pane, West, VI	1928–29	219	26	0
Pane, West, I	1929–30	410	14	14
	1930–31	Not worked.		
	1931–32	Do.		
	1932–33	Do.		
Karadikal, Charadikal and Basavangudi Blocks	1933–34	1,885	6	4
	1934–35	....		
Thalli, VI	1922–23	Not worked.		
Thalli, I and VI	1923–24	739	22	8
Thalli, I to VI	1924–25	897	17	10
Thalli, III, IV and V	1925–26	905	7	6
Thalli, III to VI	1926–27	2,445	21	11
Thalli, I, II and V	1927–28	713	7	8
Thalli, V and VI	1928–29	2,688	2	8
Thalli, VI and V	1929–30	1,943	15	7
Thalli, I	1930–31	1,434	24	11
Malliguddai unreserves	1931–32	234	12	3
Kempathpalli unreserves	1932–33	40	4	4
Achbal, Belalam, Kempathpalli and Malliguddai	1933–34	1,889	15	4
	1934–35	....		
Anchetti, VI and IV	1922–23	663	17	12
Anchetti, I	1923–24	672	2	8
Anchetti, I and II	1924–25	219	27	8
Anchetti, I to III	1925–26	596	27	4
Anchetti, III to V	1926–27	411	12	0
Anchetti, V	1927–28	330	25	0
Anchetti, VI	1928–29	262	19	6
Anchetti, I	1929–30	1,204	17	10
Anchetti, II	1930–31	364	0	12
Anchetti, III	1931–32	70	8	5
Anchetti, III and Hulibanda unreserves	1932–33	3,687	9	8
Anchetti, III and Natrapalayam unreserves	1933–34	2,255	4	0
	1934–35	....		
Urigam, VI	1922–23	656	25	14
Urigam, I and II and porambokes	1923–24	36	15	0

Felling series and coupe number.	*Year.*	*Actual outturn realized in.*		
		QRS.	LB.	OZ
(1)	(2)	(3)		
Urigam, II and VI	1924–25	50	1	0
Urigam, III, IV and Urigam unreserves	1925–26	1,145	7	7
	1926–27	1,686	13	4
Urigam, V	1927–28	944	10	12
Urigam, VI	1928–29	3,504	25	4
Urigam, I	1929–30	271	16	8
Urigam, II	1930–31	334	15	2
Urigam, III	1931–32	287	13	0
Urigam, III and Athinatham spike area	1932–33	1,858	20	12
Urigam, III, Bilikal, Urigam and Kotayur unreserves	1933–34	526	10	0
	1934–35	....		
Gulhatti, East	1922–23	Not worked.		
Gulhatti, III, IV, V and VI	1923–24	2,324	11	2
Gulhatti, III and VI	1924–25	1,283	17	4
Gulhatti, IV, V and VI	1925–26	2,837	1	0
Gulhatti, III and VI	1926–27	1,936	17	8
Gulhatti, V	1927–28	1,222	11	8
Gulhatti, III and VI	1927–28	172	17	12
Gulhatti, VI	1928–29	954	24	10
Gulhatti, I	1929–30	1,326	22	12
Do.	1930–31	814	9	2
Maniyambadi unreserves	1931–32	1,111	16	9
	1932–33	Not worked.		
	1933–34	Do.		

96. *Management of sandal in Dharmapuri Range.*—Organized exploitation of sandalwood in Dharmapuri range appears to be of comparatively recent origin, there being no record of any systematic sandal working prior to 1915 in that range. Dharmapuri range was presumably not considered to be a sandalwood producing area and it was probably for this season that the range was not included in the working plan prepared by Mr. Wilson. As already noted, working plans for the entire range drawn up by Mr. Dawson in 1910 and by Mr. Sadasiva Iyer in 1913 did not receive sanction for one reason or another. It was the Board's intention that Mr. Wilson should deal with this question, but he was unable to take up the work. In spite of the several efforts made, the range has never been brought under a carefully prepared working plan. In 1915 the Tholavubetta Extension reserve was transferred to Dharmapuri range and was worked for sandal. In the year following the adjoining unreserve was worked and arrangements were made to exploit the Bettamugalalam unreserve in the next year. In 1917, Mr. Scot, then District Forest Officer, drew up a provisional scheme for working the Dharmapuri sandal areas, which was approved by the Conservator. Mr. Scot divided the tract into two types ; Type I containing a considerable proportion of dead and dying trees which could yield heartwood, and Type II consisting almost entirely of young growth. Out of the areas in Type I, he formed an exploitation series, called Working Series A which was divided into six some what vaguely defined annual coupes. In this series only dead trees were to be removed. Areas in Type II were brought under Working Series B, again divided into six coupes, in which the primary object of management was to tend and improve the growing stock. In the B series the cultural operations prescribed for each coupe were to extend over a period of three years, so that three coupes in this series would under working each year from the third year of the scheme. The following statement shows the results of working under Mr. Scot's scheme:—

Working Series 'A'.

Coupe number.	*Area in acres.*	*Locality.*	*Year of working.*	*Number of trees extracted.*	*Yield.*			*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)			(7)
					QRS.	LB.	OZ	
I	2,873	Marandahalli, North ..	1917–18 ..	413	198	22	0	
II	2,956	Marandahalli, South ..	1918–19 ..	478	214	15	10	
III	4,050	Guttirayan	{ 1919–20 ..	2,322	1,192	24	7	} A big yield which could not be removed in one year.
			{ 1921–22 ..	225	98	9	0	
IV	1,168	Tholavubetta extension ..	1920–21 ..	230	89	19	0	
V	672	Madapanur unreserve ..	1921–22 ..	923	337	10	1	
VI	1,907	Bettamugalalam unreserve	1922–23 ..	153	120	10	8	

NOTE.—The above outturn is exclusive of random removals of spiked trees where found.

Working Series 'B'

Coupe number.	*Area in acres.*	*Locality.*	*Year of working.*	*Result of operations.*
(1)	(2)	(3)	(4)	(5)
I	320	Dod Kalhalli, Gudiyur and Pullahalli.	1917–18 ..	No tending, clearing or sowing done.
II	2,630	Portions of Galigattam reserved forest, blocks A. and B.	1918–19 ..	Do.
III	210	Alagattu and Kuntikerai in Kesarguli reserved forest.	1919–20 ..	Do.
IV	2,188	Kotur Drug in Morappur reserved forest.	1920–21 ..	409½ measures of sandal seeds were dibbled at a cost of Rs. 37–8–0, but without appreciable success.
V	477	Anaibidda Halla valley in Guttirayan and Wodapatti reserves.	1921–22 ..	Nothing done in 1921–22, but in 1918, an unknown quantity of seeds dibbled at a cost of Rs. 8–6–0. Results unknown.
VI	1,638	Akulathimmanahalli in Bevanur reserved forest.	1922–23 ..	Nothing done.

97. It will be seen that the exploitation section of Mr. Scot's scheme was worked regularly, though the tending and regeneration operations prescribed for series B were neglected. In 1919 Mr. Salisbury, the Range Officer, embodied Mr. Scot's ideas in a more elaborate working scheme, but this scheme was not sanctioned and the work was continued under the original scheme. Mr. Scot's scheme expired in 1922–23 but as no revision of it had been made, it continued to be in force for two years more. A revised scheme prepared by Mr. Hart in 1924 was sanctioned by the Conservator in 1925 and was brought into force with effect from April of 1925. Mr. Hart did away with the distinction between a tending series and an exploitation series and brought the sandal areas in the range into one working circle divided into eight coupes. He prescribed the removal of spiked and dead trees. Tending was to be done at the time of enumeration and artificial regeneration was limited to the formation of two half acre plantations of sandal with suitable hosts in each coupe. The results of working under this scheme are shown below :—

Coupe number.	*Area in acres.*	*Locality.*	*Year of previous working.*	*Prescribed year of working.*	*Year in which worked.*	*Yield in.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
						QR. LB. OZ.
I	3,475	Marandahalli North	1917–18	1923–24	1923–24	283—21—8
II	2,956	Marandahalli South	1918–19	1924–25	1924–25	81—15—4
III	6,246	Galigattam reserved forest and Bettamugalalam unreserves.	1922–23	1925–26	1925–26	1,716—20—5
IV	5,504	Kesaraguli and Morappur reserves (parts).	..	1926–27	1926–27 1927–28	582—24—5 843—26—8
V	2,214	Tholavubetta Extension and Madapanur unreserve.	1920–21 1921–22	1927–28	1927–28 1928–29	149—27—4 460— 9—8
VI	4,050	Guttirayan reserved forest ..	1919–20 1921–22	1928–29	1928–29	..
VII	2,867	Marandahalli Extension West.	..	1929–30	Scheme was superseded by a revised scheme in 1929–30.	
VIII	3,267	Anaibidda halla valley and parts of Guttirayan, Wodapatti, Bevanurmalai and Pennagaram reserves.	..	1930–31	..	..

98. The coupes under Mr. Hart's scheme were found to be too unwieldy and much difficulty was experienced in going over such large coupes in one year. Revision of the scheme became necessary and was undertaken by Mr. Thathachari, the Range Officer, under the instructions of Mr. Mitchell. The revised scheme was approved by the Conservator, so far as the exploitation operations were concerned, and introduced in 1929–30. The sandal areas were allotted to two series, called the Marandahalli and Pennagaram series, and both series were to be worked on a felling cycle of six years. The exploitation was limited to the removal of only dead trees. By way of artificial regeneration, it was prescribed that sandal seeds should be dibbled in the pits left after the extraction of dead trees.

The tending of coupes, on routine lines, was also laid down. The scheme forecasted an annual outturn of from 7 to 10 tons. The result of work done under this scheme are presented below :—

Coupe number. (1)	*Area in acres.* (2)	*Locality.* (3)	*Prescribed year of working.* (4)	*Year in which worked.* (5)	*Yield in rough cleaned wood.* (6)	*Remarks.* (7)
		Pennagaram Series.				
					QR. LB. OZ.	
I	2,752	As per scheme	1929–30	1929–30	44— 9—12	
II	2,752	Do.	1930–31	1930–31	28— 8— 2	
III	2,214	Do.	1931–32	1931–32	142—18— 8	
IV	2,000	Do.	1932–33	1932–33	79— 2—12	
		Spike area	..	1933–34	543—27— 8	
V	2,050	.. ..	1933–34	..	Not worked.	
		Marandahalli Series.				
I	3,475	Spike area	1929–30	1930–31	4,137—20— 9	
				1931–32	304—25—12	
II	2,956	Do.	1930–31	1932–33	925— 6— 8	
				1933–34	361—26— 0	Excluding chips and dust.
III	1,907	Do.	1931–32	1931–32	481—10— 6	
IV	2,000	Do.	1932–33	Not worked.		
V	2,339	Do.	1933–34	Not worked.		
		Other areas not prescribed but worked.				
		Guttirayan spike area	..	1929–30	1,025—10— 3	
	500	Guttirayan	..	1932–33	721—24— 4	
	320	Galigattam spike area ..	..	1932–33	472—21—12	
		Beedamarathupatti spike area.	..	1933–34	..	
		Pennagaram C. IV (spike area).	..	1933–34	543—27— 8	
		Kodagerai unreserve spike area.	..	1933–34	466—21— 2	
		Galigattam spike area	..	1933–34	595— 5— 0	

99. A detailed enumeration of the sandal trees of 3 inches and above in girth was made in 1936 when the working plan was prepared by Mr. C. R. Ranganathan. The trees were classified into 'dense', 'medium' and 'sparse' and also 'healthy', 'spiked' and 'dead'. Basing on the density of the crop and the mortality of spike, 21 felling series were formed in order to enable one Forester to go over the coupes of the series. A felling cycle of three years was fixed. Eight separate felling series for the unreserves were also constituted in view of their legal position. A rough yield of 545 tons of sandal wood in the first cycle and 330 tons, in the subsequent cycles was contemplated. In the first cycle the yield was 333 tons, 411 tons and 646 tons, respectively. In 1936–37, to make up 646 tons, actually 94,439 trees were felled of which 34,573 trees were found to contain no heartwood. Since the extraction of these sapwood trees involved a lot of unnecessary extra work and expenditure, it was decided not to extract from 1937–38 onwards trees of less than 3 inches in girth—Vide Chief Conservator's Proceedings No. 528, dated 20th November 1936.

100. The outturn of yield obtained during the period of this working plan is given in the following statement :—

Year.	Number of trees extracted.	Quantity of rough cleaned wood in tons.
1937–38	92,974	639
1938–39	91,079	781
1939–40	78,576	604
1940–41	72,501	515
1941–42	47 048	445
1942–43	32,326	480
1943–44	19,730	240
1944–45	11,712	165

101. In Mr. Ranganathan's working plan tending of sandal had been prescribed. This prescription was cancelled by the Chief Conservator in his No. 492, dated 18th October 1938, due to the prohibitive cost and for the reason that exposing of sandal by tending would encourage the spread of spike. However, the District Forest Officer was allowed the discretion to carry out tending wherever necessary. Due to the profuse regeneration of sandal and also to the rapid spread of lantana, it was considered that there were not sufficient host trees. The raising of *Cassia siamea* in patches, was therefore prescribed as this species was considered a spike-resistant host.

102. *Cassia siamea* was grown in patches, with the double object of controlling lantana and serving as a spike-resistant host. This was ordered to be discontinued in Chief Conservator's Proceedings D. Dis. No. 703-40-B, dated 12th October 1940, as the species was not found to be a good host.

103. *Exploitation of bamboos.*—There is no reliable record of the early history of bamboo working in the division. It is recorded that in Dharmapuri range the exploitation of bamboos was regulated up to 1910 by the issue of permits. An attempt was made to introduce the lease system after this date with partial success, so that removals on departmentally issued permits and working by contractors were concurrently in force till 1914–15 in which year five bamboo felling series each consisting of three coupes were selected and one coupe in each series was leased out. The three-year cycle was, however, not adhered to, for in the year following the bamboo areas in the range were reconstituted by Ranger Salisbury under Mr. Latham's instructions again into five felling series on a cycle of five years. This arrangement was embodied in reconnaissance report for the Dharmapuri range and was provisionally approved by the Conservator Mr. Lughington, who, however pointed out that the most recent experiments pointed to rotation of three or at the most four years for bamboo. (Conservator's Office Note 27 of 15, dated 13th June 1917, to the District Forest Officer, North Salem.) The coupes were worked fairly regularly and steady prices were realized.

104. The position in the Denkanikota range was probably very similar to that in Dharmapuri. Mr. McCarthy notes in the District Forest Note-book that "in 1912 the bamboo working plan for (Salem division, North) was changed to a 3-year rotation. The change of rotation was not approved locally, owing to the intensive nature of the fellings and the fact that, four-fifth of the demand is for large, strong building material; the 3-year rotation will in a year or two exhaust the supply, and unless a market for splits and matting be developed by then there must be shortly a slump in these areas." The 3-year cycle appears to have been viewed with disfavour by the profession at this period. Mr. Latham records in 1914 that "the bamboo series have been sold in 1914–15 for three years under the Conservator's instructions. Personally I consider the 3-year rotation to short as bamboos are required for building (roof work, etc.), and the 3-year rotation will not give the culms time to mature." It is not certain when the rotation was changed to five years, but apparently the change was made at the same time as Dharmapuri range.

105. In Anchetti range, two bamboo series, namely, the Anchetti and Piligundlu series, were opened in 1928–29. Prior to that date there does not appear to have been any considerable exploitation of bamboos in that range, the petty local demand having been met by the issue of permits.

106. When Mr. Krishnan undertook the preparation of a comprehensive bamboo working scheme for the old division, in 1930 the position was as follows. There were four felling series on a cycle of five years in Denkanikota West range, three series on a cycle of five years and one series on a cycle of four years in Denkanikota East range, and six series on a cycle of five years in Dharmapuri range, while in Anchetti range the two newly opened series were worked on a cycle of three years. A new series, called the Morappur series, had been added in 1929–30 to the five previously existing series in Dharmapuri range. Thus out of the 16 series under working in 1930, 13 were on a cycle of five years, one on a cycle of four years and two on a cycle of three years. The following statement gives particulars of the coupes :—

Serial number and name of felling series.	*Coupe number and area in acres.*					*Remarks.*
	I	II	III	IV	V	
			Denkanikota East Range.			
1 Aiyur	1,400	1,330	1,400	1,362	1,400	
2 Gulhatti	1,998	1,895	1,375	1,605	1,505	
3 Tholavubetta	2,147	1,644	1,462	1,883	1,579	
4 Manchi	975	1,112	1,128	904	931	
			Denkanikota West Range.			
5 Hulibanda	1,648	1,456	1,672	1,931	..	Only four coupes.
6 Javalagiri	1,485	1,475	1,555	1,400	1,848	
7 Pane	3,016	3,944	1,970	1,904	3,000	
8 Thalli	2,098	2,408	2,016	2,608	2,198	
			Dharmapuri Range.			
9 Panjapalli	1,494	750	750	1,600	1,410	
10 Marandahalli	1,116	750	500	1,050	1,080	
11 Kottur	947	500	500	1,040	718	
12 Galigattam	896	500	500	1,640	1,470	
13 Guttirayan	4,594	1,000	1,000	3,280	3,488	
14 Morappur	1,000	975	..	..	..	Only two coupes worked. Constituted in 1929–30. New scheme came in 1930–31.
			Anchetti Range.			
15 Anchetti	1,472	1,810	2,180	..	..	Only three coupes. Opened in 1928–29.
16 Biligundlu	1,845	2,312	1,950	..	..	

107. The variety of felling cycles in vogue in the division and the fact that a considerable area of bamboo forest, especially in Anchetti range, had not been brought under working rendered an overhaul of the bamboo working desirable and the work was entrusted to Mr. E. K. Krishnan. A revised working scheme was drawn up by him in 1930 on the basis of stockmaps prepared in the course of his inspections. This scheme, though not yet sanctioned, was brought into effect in 1930–31. It created 23 felling series on a uniform felling cycle of three years. The Bamboo Working Circle embraced an aggregate area of 194,208 acres. Particulars relating to the felling series are given below :—

Range.	*Serial number and name of felling series.*	*Area in acres of* Coupe I.	Coupe II.	Coupe III.	Felling series.
Denkanikota (East)	1 Tholavubetta	3,308	1,500	3,088	7,896
	2 Manchi	1,632	1,700	1,632	4,964
	3 Kempakarai	2,526	2,358	2,928	7,812
	4 Aiyur	3,286	3,744	1,904	8,934
	5 Sameri	3,252	1,648	3,248	8,148
	6 Gulhatti	1,800	1,800	1,712	5,312
				Total ..	43,066
Denkanikota (West)	7 Thalli North	2,208	2,092	2,240	6,540
	8 Thalli South	2,053	1,592	1,856	5,501
	9 Hulibanda	2,630	4,016	6,080	12,726
	10 Pane West	3,158	7,286	5,696	16,140
	11 Javalagiri	3,200	7,140	3,520	13,860
	12 Pane East	5,127	2,928	3,072	11,127
				Total ..	65,894
Dharmapuri ..	13 Guttirayan	7,434	5,776	7,310	20,520
	14 Marandahalli	579	1,944	2,291	4,814
	15 Kottur	2,091	2,088	1,954	6,133
	16 Morappur	2,320	1,776	2,320	6,416
	17 Panjapalli	2,608	3,360	2,214	8,182
				Total ..	50,444
Anchetti	19 Anchetti	1,440	1,810	2,432	5,682
	20 Biligundlu	1,920	2,700	2,376	6,996
	21 Taggati	2,272	2,000	2,368	6,640
	22 Urigam	1,760	1,830	3,712	7,302
	23 Natrapalayam	2,406	2,770	3,008	8,184
				Total ..	34,804

108. The working scheme prescribed that fellings should be limited to culms over one year old and should be evenly distributed over the clump, at least six mature culms being left in each clump. Cutting of culms below the second node from the ground was prohibited.

109. In one respect Mr. Krishnan introduced an important innovation. Unreserve areas which had till then been separately worked or not worked at all for bamboos were lumped together with adjoining bamboo bearing areas in reserved forest and constituted into joint coupes, composed partly of reserved and partly of unreserve. His justification for this procedure was also follows. " The stock in these unreserved forests used hitherto to be sold by the Revenue Department and this resulted in a clash of interest between contractors of adjoining areas, which did not conduce to smooth working. Moreover, the prices realized for coupes sold in the unreserved forests by the Revenue Department were generally ridiculously low. In some cases defaulting contractors of the Forest Department gained access for mere nominal sums by right of such leases to the vicinity of valuable forest areas and on the pretext of removing bamboos from their leasehold committed theft of forest produce from adjoining reserved forest ". The Collector agreed in 1929 to the proposal that in future bamboos in unreserves should be leased out by the District Forest Officer at the same time as bamboos in reserved forest. Mr. C. R. Ranganathan held the following view as regards the above arrangement :—" The management of adjoining blocks of forest by two departments undoubtedly leads to evil consequences and there can be no question of the desirability of control by the District Forest Officer of the sale of unreserve bamboo areas. But it seems objectionable to us to club reserves and unreserves into joint coupes. Bamboos are classified, not reserved, trees and may, as such, be felled by the ryots for the satisfaction of their domestic and agricultural needs, under permits issued by village officials. Strictly speaking, therefore the right of a lessee to fell bamboos in an unreserve area is subject to the prior right of the ryots to obtain their bamboo requirements on payment of the prescribed seigniorage fee. For this reason, and also because unreserves are impermanent units subject to alterations in area on account of sivayijama and assignments, it is undesirable in practice, as it is objectionable in theory, to bring unreserves into joint coupes with reserves. A further argument in favour of giving separate treatment

to unreserves is that such lands are in the administrative charge of the Revenue Department, who may at any time decide to resume the power, now delegated to the Forest Department, of leasing the bamboos occurring on them ".

110. In the working plan of 1934 the bamboo area in the reserves was classified separately as commercial section and the unreserves as village section and divided the former into 22 felling series and latter into four felling series. A 3-year rotation was fixed.

111. *Exploitation of firewood.*—In 1893 the system of located fellings was introduced under which a permit-holder was obliged to cut firewood in a specially demarcated area. This restriction marked an advance on the system previously in vogue of random, uncontrolled permit fellings. A measure of supervision became practicable and some attention could be paid to the future crop. Regular working under the system of located fellings did not, however, commence till 1900 when Mr. Brasier constituted definite felling series and placed the work on a proper footing. The method followed was that of coppice with standards, the number of standards varying from 15 to 25, while the rotation adopted ranged from 20 to 30 years. Generally such coupes were closed to grazing one year in advance of and five years subsequent to fellings. The greatest demand for firewood arose from the railway, which then burnt firewood in its engines, and from the Remount depot at Mattigiri. What exactly was the quantity of fuel supplied from North Salem to the railway is not ascertainable, but for the whole of Salem district it used to vary from 200 to 500 tons a month during 1892–94, and was 1,200 tons a month in 1896 and 2,200 tons a month in 1899. During the next three years the supply gradually fell to 1,150 tons a month and after 1906 the railway demand petered out, and coal took the place of firewood in the engines.

112. Efforts appear to have been made to develop markets in urban and trade centres, and presumably depots were opened at various places such as Denkanikota and Hosur, in order to ensure an organized supply of fuel. A depot was opened at Bangalore on Broadway Road in 1905 with the object mainly of creating a market for the surplus stock of Krishnagiri range (then part of North Salem). During the period 1906–1912, the exploitation of firewood, appears to have been carried out largely departmentally, the outturn being taken to and marketed at the various departmental depots. In 1912, the Board of Revenue decided to stop departmental working and to make efforts to replace it by exploitation through the agency of contractors. In pursuance of this change of policy, the Bangalore depot was closed despite the protests of the District Forest Officer, the Collector and the Bangalore Municipal Commission who feared that the public would be victimized by the contractors. It is probable that the other depots were also closed at this date but no reliable records are available.

113. The change of policy referred to above resulted in the constitution or, in certain cases, the reorganization of fuel felling series in Naganur, Thalli and Sanamavu reserves in Denkanikota range and in Pennagaram, Kesaraguli and Marandahalli reserves in Dharmapuri range. The attempts to find contractors for these coupes were not very successful. The Pennagaram and Marandahalli coupes could not be worked in 1912–13 for want of bidders. These coupes were leased out in the year following for Re. 1 per acre. Coupes in the Naganur and Thalli reserves were more successful in the beginning, but the coupes in the former were unduly large, being about 200 acres in extent. The system of fellings adopted was coppice with standards.

114. It does not appear that any working schemes were prepared for any fuel series in Denkanikota range.

In Dharmapuri range, fuel working was dealt with in the unsanctioned working plan prepared by Mr. Sadasiva Iyer, and later (1917) in a reconnaissance report for the range prepared by Forest Ranger Mr. Salisbury under the instructions of Mr. Scot who was then District Forest Officer. This report provided for the working of three coupes annually in Dharmapuri range, namely, the Marandahalli coupe (50 acres), the Kesaraguli coupe (70 acres), and the Pennagaram coupe (70 acres). A fuel series was opened in the Javalagiri reserve in 1921–22, but it was not popular and had to be abandoned after the second year of working. In 1930–31 another felling series was started in the Pane reserve for the supply of Denkanikota under a tentative scheme sanctioned by the Conservator, but work ceased after the first year owing to want of demand. Mr. C. R. Ranganathan's working plan (1934) proposed four fuel series, viz., Denkanikota, Hudedurgam, Sanamavu and Pennagaram series.

Denkanikota East Range.

(1) *Hudedurgam felling series.*—The series was opened in 1917–19. Coupes were worked as follows :—

Coupes I to VII of a total area of 613 acres were worked between 1917 and 1925
Coupes VIII to X were not worked at all.

Denkanikota felling series.—In order to meet the local demand at Denkanikota, a fuel felling series was formed in Denkanikota reserve in the working plan of 1934. Coupe I was sold in 1935 but the contractor worked only 13 acres out of 33 acres. Subsequently, coupes were not sold and it was decided not to work them from 1941 onwards due to the poor growth and want of demand. However, demand arose from 1945 onwards due to war and Coupes II, III, IV and V were sold and worked.

Denkanikota West Range.

(2) *Noganur felling series.*—Located departmental fellings were carried out in eight coupes over an aggregate area of 514 acres up to 1906. Further work was stopped till 1912. A fresh series was then opened with a revised allocation of coupes. Coupes worked are the following :—

Coupes I to V of a total area of 828 acres were worked between 1912 and 1919, the last coupe being worked from 1916 to 1919. Coupes VI to IX of an area of 412 acres were worked between 1918 and 1922. No coupes were worked between 1918–1925. The unfelled arrears in coupe III, 140 acres, were worked between 1926 and 1928. Coupe XVI was worked in 1928–29, and coupe XVII in 1929–30. Further work in this series was stopped with the approval of the Conservator, on account of the presence of good sandal regeneration all over the reserve.

(3) *Thalli felling series.*—This series was opened in 1912. Coupes worked are as follows :—

Coupes I to IV of an area of 167 acres were worked between 1912 and 1916, and coupes V to VIII, 179 acres in area between 1917 and 1919. Unfelled arrears in coupes V, VII and VIII were worked between 1919 and 1923. No coupes were worked after 1923.

(4) *Javalagiri felling series.*—This series was started in 1920. Only two coupes were worked, namely, Coupe I (50 acres) in 1920–21 and Coupe IV (37 acres) in 1921–22. No more coupes were sold for want of demand.

(5) *Sanamavu felling series.*—Four coupes appear to have been worked in Sanamavu reserve up to 1906. No record exists of any fuel working in the interval between 1906 and 1912, in which latter year fellings were resumed. Between 1912 and 1915 four coupes of an aggregate area of 435 acres were worked. A revised felling series with a reallocation of coupes was started in 1916 and the following coupes were worked :—

Coupes I to III, area 345 acres worked (probably) from 1917 to 1920. Coupes V and VI, area 182 acres worked between 1921 and 1923. Coupes VIII and IX, area 253 acres, worked between 1924 and 1926. Coupes X to XIII, area 407 acres, worked between 1926 and 1930. Coupe XIV could not be sold in 1930–31 for want of demand.

Though further work in the Sanamavu series was stopped till 1934 on account of the poverty of the growth and the appearance of sandal in the forest, fuel felling was resumed in this series according to Mr. C. R. Ranganathan's working plan and Coupes I to XIII had been worked till 1948 and the local demand for fuel was thus met.

(6) *Pane felling series.*—This series was opened in 1930 with the approval of the Conservator, for the supply of fuel to Denkanikota in compensation for the Naganur series which was closed to fellings in that year. Coupe I was sold, but was not worked except 3·5 acres. Subsequent coupes could not be sold.

Dharmapuri Range.

(7) *Pennagaram felling series.*—This series was started in 1909 and the following coupes have been worked :—

Coupes I to III, area 502 acres, worked between 1909 and 1912. No work between 1913 and 1920.

Coupes IV to VI, area 174 acres, worked between 1921 and 1924.

No work in 1925.

Coupes VII to XI, area 234 acres, worked between 1926 and 1930.

Coupe XII was put up to auction in 1931, but there was no demand.

No further coupes had been felled in this series till 1934, when this felling series was reformed and, from that year, nine coupes have been worked.

(8) *Thoppur felling series.*—Prior to the sanction of a working scheme for the Thoppur reserved forest the work was irregular and fitful. In 1933, a tentative fuel working scheme was prepared for this reserve and Parigam B series which was sanctioned by the Conservator in his R. Dis. No. 307/23, dated 23rd April 1923, under this scheme, two fuel felling series were formed, viz., Thoppur North and South combining Thoppur and Parigam series. Twelve coupes were worked in Thoppur South series. This working scheme was followed by the Working Plan prepared by Mr. V. S. Kuppuswamy for the period from 1930–31 to 1939–40. Sanctioned in Chief Conservator's Proceedings No. 228, Press, dated 26th April 1938. Fourteen coupes were worked from 1934–35.

In Parigam B reserve, nine coupes had been worked prior to the working scheme sanctioned in Conservator's R. Dis. No. 307/23, dated 26th April 1923. In 1931–32 and 1933–34, three coupes in each of the two series in Parigam B reserve were worked in order to test the demand for fuel. According to Mr. V. S. Kuppuswamy's working plan sanctioned in Chief Conservator's Proceedings No. 228, Press, dated 26th April 1938, fourteen coupes had been worked from 1934–35.

(9) *Badanavadi felling series.*—Though not prescribed in Mr. V. S. Kuppuswamy's working plan, it is seen from the control records that coupe I of 73 acres and coupe I of 61 acres were worked in 1934–35 and 1935–36. In 1936–37 further working of the series was stopped, presumably for want of demand. During the War years, however, the working in this series was resumed and coupes III to V had been worked till 1946–47.

(10) *Cauvery valley felling series.*—Due to the increased demand for firewood from Mettur Industries during the War years, a working scheme was prepared by Mr. A. A. Khan sanctioned in Conservator's No. 245/42-A, dated 17th June 1943. Coupe I of 196 acres was worked in 1941–42 and coupes II to VII of an average area of 100 acres each had been worked till 1946–47 in Badanavadi reserve.

(11) *Perumbalaimalai felling series.*—Under the same scheme this series was opened. Coupes I to VI of roughly 100 acres each had been worked till 1946–47.

(12) *Bevanurmalai felling series.*—Due to increased demand at Mettur and Dharmapuri, coupes I to VII have been worked till 1946–47 under the above scheme.

(13) *Marandahalli felling series.*—Although projected much earlier, this series was actually opened to fellings only in 1921.

The following coupes have been worked :—

Coupes I and II, area 75 acres, worked between 1921 and 1923.

No work from 1924 to 1927.

Coupes III and IV, area 72 acres, worked between 1928 and 1930.

Coupe V was put up for sale in 1931, but there was no demand.

115. Considering the obligation of the department to meet the fuel requirements of the local villagers, Mr. C. R. Ranganathan selected 1,797 acres to form a fuel felling series. In Coupe I of 1935 was sold, but the contractor worked only 20 acres out of 60 acres. In 1936, coupe II was sold and the contractor had not worked the coupe completely. In 1937, the arrear areas of Coupes I and II were sold. These arrear areas also had not been worked completely. In 1938, coupe III of 58 acres and arrear area of 21 acres in coupe II were sold. Coupe IV was sold in 1939 but only nine acres were worked. For want of demand, this series was closed in 1941—vide Chief Conservator's D. Dis. No. 343/40-B, dated 7th August 1940. Owing to demand in the War years coupes V to VIII were worked from 1944–45 though not completely.

Krishnagiri Range.

116. The following series are in the reserves of Krishnagiri range which was transferred from Vellore West division. Prior to 1882, these forests had been worked for firewood under permit system issued on seigniorage rates. The evil effects of this method were realised and, in 1885, fellings were restricted to certain areas near Pachur Railway Station, making the contractors fell all trees. In 1888 the method of coppice with standard was introduced and the coupes were departmentally worked. Though definite area for working was prescribed, no rotation was adopted. In 1901 the rotation was fixed at 32 years. Departmental working continued till 1908. Subsequently coupes were leased out to contractors but, with the Railway demand for firewood decreasing year after year, there was no continuity of work. In 1924 redistribution of fuel series was made under the working plan prepared by Mr. D. L. Sathe, sanctioned in Chief Conservator's Proceedings No. 316, Press, dated 10th November 1924. In 1933 the Maharajagadai series was divided into two series, viz., Maharajagadai East and Maharajagadai West—vide Chief Conservator's Proceedings No. 367, dated 17th August 1933. The 40 years rotation fixed by Mr. Sathe was changed in 1933 to 50 years for Nerlapalli and Maharajagadai series—vide Chief Conservator's Proceedings No. 367, dated 17th August 1933. In 1935, Mr. A. R. Brand prepared a plan for the Vellore West division. Five " regular " fuel series and one " reserved " series were formed for Krishnagiri range reserves. A rotation of 40 years was fixed.

Nerlapalli felling series.—Coupes I to X had been worked from 1937–38.

Maharajagadai East felling series.—Coupes I to XI had been worked from 1937–38.

Maharajagadai West felling series.—Coupes I to X had worked from 1937–38.

Burgur felling series.—Coupes I to XI of about 36 acres each had been worked till 1946–47.

Nandibanda felling series.—Coupes I to XI had been worked till 1946–47.

Kothur felling series (*Reserve*).—Due to demand in Madras, this reserve series was opened from 1941–42 and six coupes have been worked.

117. The demand for firewood in the petty villages adjoining the reserves is usually small. The sources of supply are various so that although a demand for forest firewood undoubtedly exists, it is insufficient to interest big contractors. This state of want of demand and low prices continued till the World War II started. During the War years and after, there has been very keen demand for all fuel coupes except in Denkanikota and Hudedurgam series.

118. *Exploitation of timber*.—In Dharmapuri range, it is recorded that located timber fellings under the selection system were made departmentally from 1902 to 1912 in the Wodapatti and Guttirayan reserves. Agricultural implements, such as ploughs and yerkals, were extracted from 1905 to 1908 departmentally, mainly from the Pennagaram reserve, for supply to the neighbouring ryots. The quantity of timber removed from the Wodapatti reserve between 1902 to 1912 was 10,276 cubic feet, while that from the Guttirayan reserve was 7,916 cubic feet. It is not known what species of timber were exploited, but the greater part of the outturn was probably *Hardwickia binata*. The number of yerkals and ploughs extracted during the period 1905–1908 was 494 and 5,042 respectively, of which as many as 2,664 ploughs were obtained from the Pennagaram reserve. These departmental operations were stopped in 1912, presumably in conformity with the change of policy.

119. *Exploitation of Hardwickia binata*.—The earliest attempt to secure a large external market for *Hardwickia binata* would appear to be that made by Mr. Latham in 1915, when he entered in correspondence with one Mr. Cooke of the Kolar Gold Fields. It was found that the mines did not care for *Hardwickia binata* on account of " its liability to be attacked by boring beetles." Mr. Latham had observed that dead trees standing in the forest were attacked by what he thought was a longicorn larva, but he appears to have been surprised at the statement that the wood was prone to borer attack and referred the question to the Forest Research Institute. Institute had no information on the subject, nor was any to be found in published literature. A note by Mr. T. N. Hearsey in the file reads as follows :—

" *Hardwickia binata* timber is very liable to attack by *large* longicorns and also by several species of small Buperstid and Longicorn beetles. Timber felled on the banks of the Cauvery River in a reserve by the name of Katrimalai was practically destroyed in 1904–05 to my personal knowledge."

120. The liability of *Hardwickia* timber to damage by insects appear to have been greatly exaggerated, both by the Mine authorities and by Mr. Hearsey. Mr. Pearson of the Forest Research Institute said though he had often seen dead standing trees attacked, he had never noticed the heartwood being attacked when placed as posts in Indian dwellings. Pillars of *Hardwickia* dating back to many decades are quite common in houses in Dharmapuri taluk and they have not been attacked by insects.

121. In 1927 there was a proposal to supply *Hardwickia binata* sleepers to the Public Works Department in connection with the construction of the Mettur Dam. In order to ascertain the probable cost of extraction and other incidental charges, it was proposed to fell *Hardwickia* on an experimental basis in Wodapatti, Bevanurmalai, and Guttirayan reserves in Dharmapuri range, and in Biligundlu and Natrapalayam reserves in Anchetti range. The following three experimental coupes were laid out by Mr. Hart :—

Coupe I.—About 330 acres east of Anaibiddahalla in Guttirayan reserve.

Coupe II.—About 400 acres south of Hogainakal in the Bevanurmalai reserve.

Coupe III.—About 320 acres in the Biligundlu and Natrapalayam reserves, on both sides of the footpath from Biligundlu to Natrapalayam.

Enumerations were made and 105 trees were marked in Bevanurmalai reserve, 2,126 trees in Wodapatti reserve and 418 trees in Biligundlu and Natrapalayam reserves.

122. Experimental extraction of the timber was done in 1927–28 and 1928–29. In the former year 287 cubic feet were extracted at a cost of Rs. 145–6–0 and further fellings were stopped owing to want of demand. Of this quantity 135 cubic feet were sold for a total of Rs. 266–11–0. In 1928–29 a total quantity of 463 cubic feet was extracted at a cost of Rs 182–5–9, of which 105 cubic feet were sold at Rs. [illegible] a cubic foot. It was found very difficult to clear the balance stock.

123. In 1928 Mr. Mitchell investigated the question of exploiting *Hardwickia* in the division and prepared a note on the subject in which he arrived at the conclusion that the prospects of remunerative working of the species were exceedingly slender on account mainly of the absence of an assured demand for the timber. The Forest Utilization Officer, who was consulted on the problem of finding a market for the species, suggested its conversion into sleepers as a possible solution. He arranged for a road test to be made with 200 Broad Guage sleepers on the South Indian Railway and with like number on the Madras

and Southern Maharatta Railway, on condition that the sleepers were supplied free of cost. The cost of production of broad guage sleepers at Dharmapuri was estimated to be Rs. 4–8–4. An estimate of Rs. 2,000 for the preparation of 400 broad guage sleepers was sanctioned by the Chief Conservator in 1930. The work of preparing the 400 sleepers was entrusted to a contractor at Dharmapuri. The contractor had to face unfavourable weather conditions and encountered serious difficulties in getting sawyers, whom he had finally to import from Malabar and Sankeri. These men deserted before the work was completed, so that the end of December 1930 only 144 sleepers were ready instead of the 400 promised. This led to the summary cancellation of the contract. Of the 144 sleepers made only 122 were passed by the District Forest Officer and the Forest Utilization Officer was invited to inspect them before any more were made. He found that many were undersize, that over 50 per cent had boxed heart and that the quality of the adzing was poor and suggested that it would have been more prudent to undertake a supply of meter gauge sleepers. In 1931 sleepers were made departmentally so as to make up a quota of over 200 which were inspected by the Forest Utilization Officer in August 1931 and of which he was able to pass only 36.

124. In paragraph 438 of Mr. C. R. Ranganathan's working plan it had been proposed to exploit a limited number of *Hardwickia* house pillars annually and to convert wherever possible, a part of the remaining slash into charcoal. This attempt, having proved a failure, will not be continued in this working plan.

125. *Regulation of grazing in the past.*—The provision and regulation of grazing has always been an important and a lucrative activity of the division. The principal of management was and still is to license cattle and other animals to graze in the reserves by the issue of permits on the prepayment system. Before the introduction of the Hosur Sandalwood Working Plan, the grazing fee used to be 3 annas a cow unit on the ordinary scale and 4 annas a cow unit on the special scale. The working plan proposed the immediate raising of grazing fees to 4 annas for sheep, 8 annas for cows and bulls and 12 annas for buffaloes. It also proposed a further enhancement to 12 annas a cow unit to be brought into effect two years later. The main object of the suggested increase was to reduce the grazing incidence (which was 1 cow per 5·1 acres in Denkanikota range and 1 cow per 4·5 acres in Anchetti range), as well as to have substantial benefits to offer to helpful villagers by way of refunds of grazing fees under the Forest village System, recommended in B.P. No. 50, dated 4th April 1916. The initial enhancement proposed by the working plan was supported by the Board and approved by Government in G.O. Mis. No. 3888, Revenue, dated 3rd December 1917, and the new rates were brought into force from 1st July 1918. For very similar reasons added to the principle (recognized in B.P. No. 28, dated 2nd March 1917) that the whole of a grazing tract should be subject to the same fees, the grazing fees in Dharmapuri range were raised to the new scale sanctioned for Denkanikota and Anchetti ranges in G.O. Mis. No. 171, Revenue, dated 11th January 1918.

126. At the time of the introduction of the Hosur Sandalwood Working Plan, the block system was in force. Denkanikota range was divided into nine blocks, Anchetti range into five blocks and Dharmapuri range into four blocks. The working plan made no significant change in this system. Certain large tracts of forest known as "specially protected blocks" in Aiyur, Gulhatti, Tholavubetta and Manchi reserves, which had remained closed to grazing were thrown open and added to the grazing blocks in which they were situated. In thus admitting grazing in these 'specially protected' areas Mr. Wilson initiated a modification in the doctrine under which grazing was considered to be an unqualified evil and the enemy of all regeneration. He observed that "under present (i.e., protected) conditions it seems to be generally the case that the growth of sandal is poorer inside these blocks than outside; this state of things is probably due to the fact that the growth of grass and bamboos within them chokes the young sandal, and when it catches fire burns fiercely and kills what young trees have sprung up". The working plan does not tell us the history of these protected blocks, nor the original object of the closure to grazing. It is plain that very extensive areas were dealt with under this method of protection; the area released from closure by Mr. Wilson was over 13,000 acres. These areas had been under closure since 1885.

127. In 1912 the Conservator (Mr. Battie) directed that the area along the left bank of the Cauvery from Hogainakal westwards should be placed under rigid fire protection and should be closed to grazing. This area, which may roughly be regarded as a strip along the Cauvery 3 miles wide and 20 miles long, was accordingly divided into nine blocks of which blocks I to V were fire traced during 1912–13. During the next year all the nine blocks were fire protected and an area of 23,618 acres was closed to grazing without any reference to the Collector. Proposals were made in 1914–15 to close the whole fire protected area (49,549 acres) to grazing, but an outcry arose against even the previously existing closure and the Collector directed that only blocks I, II, IV, VI and IX should be closed to grazing and that *penning* licences should be issued for the other blocks. The working plan made no change in this arrangement and the closure remained in force till 1925 in which year Mr. Hart (then District Forest Officer) withdrew the restriction. Mr. Hart

reported in August 1925 that " our attempts at fire protection have not met with success in the past, as the luxuriance of the grass and the intensity of the summer and the high winds during that season has (sic) probably resulted in our own fire protection operations being responsible for firing the forests ". He also observed that " acha (*Hardwickia binata*) is a tree that appears to be unaffected by fires, for if this were not the case the excellent regeneration noticed in 1912 could never have existed then and to this date ". Closure to grazing and fire protection have thus been extensively tried in the Cauvery valley for a period of over ten years with results which did not justify their continuance.

128. Proposals were put up by the District Forest Officer in 1921 to raise further the grazing fees, on the ground that such enhancement would enable the Department to hold out still more attractive benefits in the shape of remissions and rebates under a Forest Village System that was still embryonic, were not convincing and were rejected by the Chief Conservator in his reference No. 815/21-1, dated 24th March 1921. A case for raising the grazing fees to a level commensurate with the market value of the privilege enjoyed existed, as it still exists, but the increase could not be justified for the sake of further depressing the incidence (and the revenue) or for the sake of a prospective and nebulous Village Grazing Scheme. It may be noted that the introduction of the Grazing Scheme prescribed in the working plan for the Manchi reserve was never carried out as the conditions were considered unpropitious.

129. In pursuance of the Chief Conservator's order that the question of enhancement of the fees should be further examined, the District Forest Officer of the Salem divisions met in conference towards the end of 1921 and drafted a joint report in which they advocated the raising of the fees to 6 annas for a sheep, 12 annas for a cow, and Re. 1–2–0 for a buffalo. These proposals were negatived in G.O. No. 495, Development, dated 17th June 1926—vide Chief Conservator's Proceedings No. 136, dated 3rd August 1926.

130. The subsequent history of grazing policy has been one of continual retreat by the Government. In 1926 the validity of the grazing permit was extended so as to cover a whole range. (Vide G.O. Mis. No. 980, Development, dated 17th June 1926.) The block system which gave the District Forest Officer a measure of control over the number of cattle grazing in any unit of area on the basis of an arbitrarily fixed possibility of the forest was thus abolished. A further relaxation was made in 1932 when the grazing permit was made valid over an entire division, provided that the highest rate prevailing in a division, was charged for the permit. (Vide G.O. Mis. No. 802, Development, dated 11th June 1932, communicated in Chief Conservator's Proceedings Mis. No. 290, dated 18th June 1932.)

131. Consequent on the classification of reserves made by Mr. Whitehead and the transfer of considerable forest areas to panchayat management in 1926, the Government directed that the question of grazing fees should be re-examined, keeping in mind the possibility of levying an uniform scale of fees throughout the Presidency. The District Forest Officers of North, Central and South Salem divisions drew up a joint memorandum on the basis of conclusions arrived at a conference at which the Collector and the Conservator had been present. This memorandum emphasized the need for adopting an uniform scale of fees in all the Salem divisions and proposed a rate of Rs. 1–8–0 for a buffalo, Re. 1 for a cow and 8 annas for a sheep. The Conservator, however, recommended a fee of 12 annas only for a cow unit. The Collector, though convinced of the need for an enhancement of the grazing fees, suggested that the proposals should lie over till January 1928, on account of the ryots having been badly hit by a succession of bad years. Certain selected Collectors who were consulted by Government on this question generally favoured an increase in the grazing fees, but were opposed to the levy of an uniform scale of fees throughout the Presidency. The question of enhancement was referred to the Agricultural Advisory Committee formed for the purpose of considering the recommendations of the Royal Commission on Agriculture. The Committee did not favour an increase in the grazing fees, but recommended that—

(1) the Forest department may encourage the cutting of grass in forests,

(2) as an experiment in certain places cattle might be kept confined in pens and grass cut and taken to them, and

(3) in cases where particular grazing areas had to be specially protected they might be closed to cattle.

These recommendations were accepted by Government. The suggestion that cattle should be penned in the reserves and stall-fed did not take account of the realities of the situation and could not be carried out even experimentally.

132. The question of raising grazing fees was revived in 1932 by the Chief Conservator as a means of improving the revenue of the Presidency and a detailed report on the subject was called for by Government in their Memorandum No. 1027-1/32-1, dated 17th June 1932. The Conservator proposed that the grazing fee be raised to 12 annas for a cow unit from July 1935 and to Re. 1 from July 1937.

133. In 1938 the Government ordered a further reduction of the grazing fee to 2 annas a sheep, 4 annas a cow and 6 annas a buffalo and these rates continue.

134. There has been a steady fall in the grazeable area of the division on account of the widespread encroachment of lantana.

135. With the reduction of the grazing fee the number of cattle going to reserved forests increased steadily since 1941–42, the number is almost double of what it was previously. The reduction of grazing area due to the spread of lantana and the increase in the number of cattle, has resulted in the over-grazing of the fringe forests.

136. *Penning.*—Penning is practised on a large scale, especially in the vicinity of perennial water courses, such as the Cauvery, the Chinnar and the Anaibiddahalla. Penning takes place in all the ranges, but its incidence is highest in Dharmapuri and Anchetti ranges. A large influx of ' foreign ' cattle takes place annually during the penning season (June to December) into the Cauvery valley, no discrimination being made against such migratory cattle. The penning fee was fixed at Re. 1 per 100 head of cattle by the Collector in his Circular No. 865 of 1902–03 published in the Forest Sheet of *Salem District Gazette* of October 1902. It remained at the same level till 1932 when it was raised to Rs. 1–8–0 per 100 head in accordance with G.O. No. 802, Development, dated 11th June 1932.

137. In 1938 the penning fee was reduced from Rs. 1–8–0 to Re. 1 per 100 head of cattle. The cattle coming from ranges other than one in which they were licensed to graze were however charged at Rs. 1–8–0 under Salem Collector's Circular No. 885 of 1902–03 and G.O. Ms. No. 595, Development, dated 29th April 1932, respectively.

138. A list of the pens in common use in the various ranges is as follows :—

List of pens in North Salem Division.

Reserved forest. (1)	Name of pen. (2)	Beat. (3)	Villages which resort to the pen. (4)	Water-supply. (5)	Pen permanent or temporary. (6)	Capacity of the pen. (7)	Remarks. (8)
			Denkanikota East Range.				
1 Tholavubetta	Yelandamaram Beedigai.	Tholavubetta	Siddapuram, Kottayur, Beetamugulam, Gulhatti, Manchi, Mitta villages from Dharmapuri range.	Tumbe Halla.	Permanent.	500	The cattle are generally penned for only six months in the year.
2 Kempakarai	Neelammanthoddi	Kempakarai	Mitta villages of Dharmapuri range and from Gulhatti, Manchi and other neighbouring hamlets.	Do.	Do.	1,500	Do.
3 Do.	Sivalinatham	Do.	Do.	Well and Halla Hebba.	Do.	1,500	Do.
4 Do.	Balanatham	Do.	Not being used	..	..	600	
			Denkanikota West Range.				
5 Pane	Bazaarrangam Extension.	Pane	Not used	Tank and river metre vanka.	Permanent.	300	
			Dharmapuri Range.				
6 Kesaraguli	Enijonai	Morappur	Sellipatti, Theetharapalli, and Baiyanur.	Nagalnarkinar.	Do.	800	Cattle penned for six months in the year.
7 Morappur	Budhipatti	Do.	Porathur and Allrampatti	Well	Do.	1,000	Do.
8 Do.	Morappur	Do.	Gudathoddanur	Do.	Do.	1,000	Do.
9 Do.	Goranadugu	Do.	Erimalai and Bhopanur	Periya Pallam.	Do.	1,000	Do.
10 Do.	Pindiguddai	Do.	Not available	Kalmadugu Pallam.	Do.	300	Do.
11 Do.	Hanumappatti	Do.	Karagur and Kahampatti	Periya Pallam.	Do.	1,200	Do.
12 Do.	Jakkal	Do.	Belrampatti, Seriyampatti, Kottayur, Galigattam, Kottur and Nallur.	Do.	Do.	1,400	Do.
13 Kesaraguli Pikkili.	Devaragatti	Pikkili	Nallaperampatti and Kadaipasam.	Chinnar	Do.	800	Do.
14 Guttirayan	Dasam Borai	Guttirayan	Mulluvadi	Do.	Do.	800	Do.
15 Do.	Kodagerai	Do.	Kodagerai	Akkamadugu	Do.	700	Do.
16 Do.	Kakaleri	Do.	Kottur, Nallur, Belrampatti and Erimalai.	Mahaderwasam, Pallam Kalmaduvu tank.	Do.	500	Generally for six months only.
17 Do.	Kaljonai	Do.	Kodagerai	Well and tank.	Do.	1,000	Cattle kept for six months only.
18 Do.	Tekkuborai	Do.	Nallaperampatti and Athukur	Anabeddamadugu.	Do.	500	Do.
19 Do.	Arasamarathupatti.	Do.	Seriyampatti, Semmanpatti and Belrampatti.	Do.	Do.	700	Cattle kept throughout the year.
20 Pennagaram	Muthur left bank	Pennagaram	Erigallnur ; Podur	Chinnar	Do.	700	Cattle penned for six months only.
21 Do.	Pannapatti	Do.	Agraharam ; Koothupadi ; Metturpatti ; Matam ; Kullalallrampathi ; Halepuram.	Chinnar and well at 3 miles 2 furlongs.	Do.	1,200	Cattle penned throughout the year.

22	Baiyanur	Sattegal	Baiyanur	Jaggampatti	Cauvery	Do.	500	Cattle penned for six months only.
23	Do.	Pandumariamman-koil.	Do.	Not available	Do.	Do.	500	
24	Badanavadi	Singarapatti	Badanavadi South.	Neruppur	Do.	Do.	800	
	Do.	Emanur	Do.	Do.	Do.	Do.	..	
	Do.	Kongawpatti	Badanavadi North.	Eriyur, Tanda, etc.	Do.	Do.	800	
	Do.	Gorapallam	Badanavadi South.	Mulakellur	Do.	Do.	..	
	Baiyanur	Godupatti	Baiyanur	Masakal, etc.	Do.	Do.	420	
				Anchetti Range.				
29	Wodapatti	Kakalnatham	Wodapatti	Agraharam, Motu Matam	Melu kinar kelu kinar.	Do.	1,000	Cattle penned for six months only.
30	Do.	Mosalmedu Doddi.	Do.	Kongarapatti; Pettanur; Podur, Kollampatti; Haldipuram, Uthumalai.	Cauvery	Do.	700	Do.
31	Ubrani	Gundalam	Ubrani	Mariyalam; Devagoundadoddi; Andevenahalli; Unsenatham; Matham; Mathikiri and Panchaltheni.	Dodda halla.	Do.	1,300	Cattle penned for six months only.
32	Do.	Theerbedi	Do.	Devagoundadoddi; Hosadoddi	Do.	Do.	500	Cattle kept for nine months.
33	Taggatti	Shamboganapatti	Taggatti	Taggatti, Arattakal; Hosadoddi; Gollapalli; Madakallu; Thargettagoundandoddi.	During rainy season a stream closely flows; some wells dug by graziers.	Do.	500	No proper water facility.
34	Do.	Devarmathi	Do.	Taggari, Gollapalli; Milithikki, Athinatham; Davagoundadoddi; Hunsankodihalli (Mysore) Veeradiswamimalai; Panchalthunai, Subukunta.	Dodda halla.	Do.	500	Cattle penned for six months only.
35	Mallahalli	Bekuppai	Mallahalli	Gollapalli; Sulakunta; Nilithikki; Arunnatham; Jeemanatham; Sarakandoddi; Mallahalli; Erumuttanhalli.	Cauvery	Do.	600	Do.
36	Taggati	Hosur	Do.	Athinatham, Arattakal; Sulakunta; Belalam.	Stream close by.	Do.	600	Do.
37	Mallahalli	Udupathi	Do.	Jeemanatham; Mallahalli; Athinatham; Udupuram.	Cauvery	Do.	900	Do.
38	Do.	Anuguli	Do.	Kottaiyur and Jeemanatham	Do.	Do.	600	Cattle penned for six months only in the year.
39	Bilikkal	Thattakarai	Bilikal	Biranhalli; Kovahalli; Gopahalli	Tank	Do.	300	No good facilities for water.
40	Do.	Kadathur	Do.	Kottaiyur; Urigam; Kumarthanpalli; Banimkudlu.	Tank near by and well also.	Do.	500	Cattle penned for six months.
41	Do.	Settahalli	Do.	Urigam; Taggati, Yessalpatti	Cauvery	Do.	1,350	Do.
42	Do.	Thollamathi	Do.	Taggati, Yessalpatti; Aragattakal, Sulakunta and Odipuram.	Do.	Do.	900	Do.
43	Kestur	Thabbaguli	Kestur	Kestur, Bilikal, Unsenatham, Kondahalli, Chikkammankoil, Sennamalam.	Do.	Do.	1,200	Do.
44	Do.	Alathibyil	Do.	Kestur, Unsenkondahalli; Manchugondapalli.	Do.	Do.	600	Do.
45	Do.	Ellola	Do.	Kestur, Manchugondapalli, Bilikal and Unsenkondapalli.	Do.	Do.	650	Do.

Reserved forest. (1)	Name of pen. (2)	Beat. (3)	Villages which resort to the pen. (4)	Water-supply. (5)	Pen permanent or temporary. (6)	Capacity of the pen. (7)	Remarks. (8)
			Anchetti Range—cont.				
46 Kestur	Grathe	Kestur	Kestur and Bilikal	Cauvery	Permanent	600	
47 Do.	Savanathola	Do.	Biyalapatti	Do.	Do.	600	
48 Do.	Muthukahalla	Do.	Unsepalli	Do.	Do.	600	
49 Do.	Olamaruthuhalli	Do.	Arattakal; Sarakandoddi	Do.	Do.	600	
50 Do.	Unsehatti	Do.	Biligundlu	Tank close-by.	Do.	600	
51 Do.	Seenbanatham	Do.	Kalthapalam and Sarathan doddi.	Stream close-by.	Do.	600	
52 Natrapalayam	Padigathu	Natrapalayam	Peddanur of Dharmapuri range; Samidoddipatti; Sulakunta and Arulnatham.	Cauvery	Do.	800	Cattle kept for six months only.
53 Anchetti	Gerhatti	Anchetti	Vannathipatti; Tamsenhalli and Sennamalam.	A stream closeby.	Do.	500	Do.
54 Do.	Gollamathi	Do.	Vannathipatti; Tamsanhalli; Gangadevanapalli; Andevanhalli; Maragattadoddi; Sakkalpalli and Mattammathikiri.	Do.	Do.	900	Do.
55 Do.	Chinnamuthur	Do.	Byrasundram; Kundukota; Venkatapuram and Salivaram.	A stream close by called Chinnar muthuar stream.	Do.	300	Do.
56 Biligundlu	Kalmaduvu	Biligundlu	Periyamolagiri; Padaginalam; Moteragi; Jamasanhalli Lakkasandur; Kurubarapalli; Natrapalayam; and Garatti.	Do.	Do.	1,200	Do.
57 Do.	Thalavai	Do.	Karandahalli; Kurubarapalli; Hosadoddi; Gopapalli; Lakkasandur; Muluvanapalli; Salivaram; Padaginalam and Manchi; Kodagarai.	Do.	Do.	1,100	Do.
58 Do.	Jagathunatham	Do.	Moteragi; Lakkasandur	Do.	Do.	1,100	Do.
			Krishnagiri Range.				
59 Hudedurgam	Kadirnatham	Hudedurgam	From villages adjoining Hudedurgam reserved forests.	Chinnar	Temporary	300	This pen is not notified but is only occasionally used for which separate sanction is received each year.
60 Marandahalli	Kuppam	Marandahalli	Pullahalli	Tonai near Kuppam tank and well near Bennatham.	Permanent	400	Water available throughout the year.
61 Do.	Sayammalkottai	Galigattam	Galigattam	Well at Kommanur.	Do.	300	
62 Galigattam	Thallipatti	Do.	Do.	Stream and well near Galigattam.	Do.	400	Contained water throughout the year.
63 Do.	Karttanai Byd.	Do.	Bhoopanur	Well	Do.	500	Do.

139. *Hay-making.*—Hay-making appears to have been a regular activity of the division so long as the Remount Depot was in existence at Hosur, especially during the period of the war. During 1917–18 hay was collected departmentally under the personal supervision of the Conservator, Mr. Lushington, in the specially protected block of Tholavubetta reserve. A quantity of 16 tons 27 quarters of hay was collected at a cost of Rs. 844, but as it was not required by the Military, it had to be sold to the Remount Depot at a loss for Rs. 327 at Rs. 20 a ton. In 1919–20 the right of collection of hay from the closed fuel coupes of Sanamavu and Hudedurgam reserves was leased out for Rs. 250. The contractor confined his collection to the coupes of Sanamavu reserve from which he obtained 52 tons 735 lb. of hay. Collection of hay was stopped after this, as there was no demand.

140. *Fodder grass.*—There has been no demand for cut fodder and this produce has not been exploited. All the same, the villagers are privileged to cut and reserve fodder grass from the reserved forests.

141. *Rotational grazing.*—In order to demonstrate the benefits of the rotational grazing Mr. C. R. Ranganathan proposed two blocks on the banks of the Cauvery, in Wodapatti and Natrapalayam reserves. The pens selected were Padigatti and Mosalamaduru. Each block of 3,000 acres was divided into three paddocks. The cattle were to graze in each paddock for the one month and during the other two months, the paddock to be closed to rest. At the end of the grazing period, which is generally from June to January, the entire area was to be inspected. This system was recommended to the Government but they did not approve of it and wanted the ryots to first understand the system. Hence, a meeting of ryots of the villages affected was held and the system was fully explained to them by the District Forest Officer and the Revenue Divisional Officer. The villagers accepted the system with modification. The Government in G.O. No. 850, Development, dated 8th April 1937, ordered introduction of the system for a period of three years from 1st July 1937 and the rotational grazing system had been introduced in Wodappatti and Thoppur reserves.

142. In 1940, this scheme was extended for one more year in G.O. Ms. No. 1916, Development, dated 16th August 1940. In 1941 another scheme was prepared by Mr. E. A. Lasrado and was sanctioned in G.O. Ms. No. 698, Development, dated 5th April 1941.

143. *Exploitation of minor forest produce.*—The early history of the exploitation of minor produce is obscure. The right to collect minor produce was first leased out by the Forest department in 1883 when one contract covered the whole district. In 1896, a separate lease was granted for each Revenue division. In 1901, a new system was introduced under which the produce was leased out separately for each reserve, while for that of unreserves firkas formed the unit of lease. Subsequently in Dharmapuri range (and possibly also in other ranges) the blocks formed for regulating grazing were treated as the units of lease for minor produce and the unreserves formed an additional block. In recent years minor produce has been leased out separately for each range unit, except for *Cassia fistula* bark which is worked on a five years rotation over the entire division. The unreserves of each range are lumped together with the reserves for the purpose of exploiting tanning barks *Cassia auriculata* (avaram), *Ventilago madrasapatnam* (vembadam or surulapattai) and *Strychnos nux-vomica*. Mr. Ranganathan's working plan included (1) *Cassia fistula*, (2) *Sapindus emarginatus*, (3) *Terminalia chebula*, (4) Honey and wax and (5) deer and sambhur horns in the list of minor forest produce to be sold. In all the four ranges, the tanning barks avaram and vembadam as well as nuxvomica are leased out jointly as a separate item ; the other varieties of produce, including 22 distinct items, being clubbed together under a second lease in Denkanikota East, Denkanikota West and Anchetti ranges.

144. Mr. Ranganathan proposed leasing of tamarind as a separate item. The entire reserves were divided into fourteen farms. In order to assess the correct amount payable to thirizvakamdars of Ubrani Agraharam, this bit was proposed to be treated as a separate unit of lease and all items of produce were to be leased jointly or severally at the discretion of the District Forest Officer. *Cassia fistula* collection was to be worked on a rotation of five years, each year one entire range being leased out. Avaram, vembadam and nuxvomica were to be leased out in one group, unit of lease being the reserves and unreserves of one range. Other items from the reserves were to be leased out jointly, each range forming the lease unit.

145. Konnai bark (*Cassia fistula*) is worked separately on a five-year rotation, the collection being confined to reserves only. The forests of the division are divided into the five following blocks, one of which is worked annually in succession :—

Block I.—All the reserves of Denkanikota West range.

Block II.—All the reserves of Denkanikota East range.

Block III.—Part of Anchetti range covering the following reserves : Kestur and Extension, Bilikal, Urigam, Mallahalli, Taggati, Natrapalayam and Ubrani.

Block IV.—Part of Anchetti and part of Dharmapuri ranges covering the following reserves : Anchetti, Biligundlu, Wodapatti, Bevanurmalai and Extension, Pennagaram and Extension and Guttirayan.

Block V.—Part of Dharmapuri range covering the following reserves : Marandahalli and Extension, Galigattam, Pikkilimalai, Kesaraguli and Extension, Morappur and Tholavubetta Extension.

146. Ubrani Agraharam lying in Ubrani reserve is a *thirizhvakam* village and certain private parties are entitled, under the forest settlement, to a share of the revenue derived from it. Owing to the difficulty of assessing the precise amount of revenue realized from the Agaraharam, the practice of including this area in the range unit was abandoned and all items for minor produce on the area are being sold separately for each year since 1930–31.

147. *Plantations and topes.*—There are at the present moment no topes under the management of the Forest department, except such as are attached to the compounds of forest buildings. In the days of the Jungle Conservancy department a large number of topes and plantations were formed, the period of greatest planting activity being between 1868 and 1872. These topes were practically confined to the Hosur plateau and were widely scattered over the plateau. None of them was of any great area, the biggest topes being the ones lying to the west of the Hosur-Denkanikota road about 6½ miles from Hosur. These topes were known as the Bylagondapalli A and B topes and were 39·81 and 11·61 acres in area respectivley. The chief species met with in the topes were *Cassia siamea*, *Mangifera indica*, *Eugenia jambolana*, and *Pongamia glabra*. *Casuarina* was also planted rarely. An espacement varying from 14 feet by 14 feet to 30 feet by 30 feet appears to have been adopted and in some cases inter-planting seems to have been done later.

148. In 1882–83, the topes came under the control of the Forest department which succeeded the old Jungle Conversancy. In 1906–07, some of the topes were handed over to the Revenue department as per Board's Proceedings Forest No. 545, Miscellaneous, dated 22nd May 1905, and 17 topes were retained in the charge of the Forest department. In 1911, Mr. C. M. Belliappa prepared a reconnaissance report as a preliminary to a working plan for the management of the topes. Nothing appears to have come of these proposals. In Resolution-Forest No. 3, dated 6th January 1914, the Board at the instance of Government called for proposals for relieving the Forest department of the charge of scattered topes in the Salem district. The topes were accordingly transferred to the control of the Revenue department in 1915.

149. Mr. Belliappa's report described the Bylagondapalli topes as follows :—

Bylagondapalli A tope—39·81 *acres.*—The tope lies near the Mattigiri-Denkanikota road about 3 miles from Mattigiri. The soil is fairly deep and uniform throughout the area. Although most of the trees (*Cassia siamea*) have been hacked, still those that are left uninjured here and there, especially along the margin of the tope show a height growth of 30 feet and more. The tope will yield fairly good results as a plantation. At present it is fairly stocked.

Bylagondapalli B tope—11·61 *acres.*—This lies close to Bylagondapalli A tope and has a similar soil and growth. But the growth, which consists of mango, has not been maltreated and hence the area is better stocked than the other ones.

The A tope is a pure plantation of *Cassia siamea*, the merits of which species so far from being a new discovery appear to have been well known as early as 1870. Even in 1911, the plantation bore signs of abuse. Twenty years more of uncontrolled hacking and ill-treatment have not succeeded in destroying the trees, large numbers of which may still be seen in the plantation. This is striking evidence of the hardiness of the species.

150. *Teak plantation.*—In order to find out if teak would grow well in the Hosur plateau, an area of 5 acres in Gulhatti reserve was planted as experimental measure in May 1941 with 5,208 teak stumps received from Palghat Division. Similar plantations, 5 acres each, were raised in 1942 and 1943. The growth was found to be poor though 80 per cent success was achieved. Further raising of teak plantation was stopped. At present the height growth of the trees in the 1941 Plantation is about 18 feet and, along the stream banks, 25 feet to 30 feet, the girths varying from 15 inches to 20 inches. The trees have a tendency to sending epicormic branches.

151. *Casuarina plantation.*—A scheme was prepared by Mr. A. A. Khan and sanctioned in Conservator's No. 2719/41, dated 31st July 1942. (Sanamavu Reserved Forest) for raising casuarina.

152. An area of 2 acres was planted with casuarina seedlings with an espacement of 7 feet by 7 feet in September 1941 near Balakunta tank. In March 1942, there were 1,100 established seedlings. Another area, 5 acres in extent, was planted up with casuarina in 1943 in Coupe IV. In January 1944, only 12 per cent survivals of very poor and stunted seedlings were noticed. Hence no further attempt was made.

153. *Hudedurgam Reserved Forest.*—In 1942–43, an area of 1·5 acres was planted with casuarina. Out of 1,654 seedlings planted, there were only 943 survivals.

154. *Aiyur Extension Reserved Forest.*—In 1942, 4·5 acres were planted with casuarina at an espacement of 7 feet by 7 feet. During 1943, 5,235 casualties were replaced. In January 1944, there were 69 per cent surviving. The growth in this reserve is satisfactory except that there was a fire in 1946 and many plants died due to it.

155. *Gulhatti Reserved Forest.*—In 1942, 5 acres were planted with casuarina. In 1943, the survivals were 35 per cent. A field crop was also raised in this plantation. The growth of casuarina was found to be satisfactory in 1947.

156. In 1945, 10 acres were planted with casuarina. The rains failed, consequently, the plantation was a failure. The Chief Conservator suggested replacing casualties with teak. In 1947, teak stumps were planted in this area and they have come up.

157. *Javalagiri Reserved Forest.*—In 1941, 0·72 acre was planted with casuarina. Casualties were replaced in 1942. Growth in this area was not satisfactory in 1947.

158. In 1942, 10 acres were planted with casuarina. In 1943, only 9 per cent survivals were noticed. Hence the area was given up.

159. *Thalli Reserved Forest.*—In 1943, 10 acres were planted with casuarina near Devarbetta. In 1944, the survivals were 65 per cent. The plantation was found to be patchy in 1947.

160. *Hogainakal–Bevanurmalai.*—In 1942, an area of 2·08 acres was planted with casuarina. The result was not satisfactory.

161. *Sandal Kumri.*—Mr. E. A. Lasrado drew up a working scheme (approved in Salem Circle Conservator's No. 493/40-C, dated 20th June 1941) in which was proposed raising of sandal kumri with the object of replacing lantana and spiked sandal in the area with more resisting hosts. Accordingly, 46·32 acres in Javalagiri during 1939, and 1940 and 29·12 acres in Noganur reserve during 1940, 1942 and 1943 were "Kumried".

In all the above areas sandal has been dibbled in 1947 in patches, half a chain apart and they have germinated.

162. *Fuel kumris—Thoppur Reserved Forest-*32 *acres-*1939.—The plot was allotted to the kumridars in 1939 and seeds of *Albizzia lebbeck, Acacia ferruginea, Neem, Wrightia tinctoria* were sown in one foot deep trenches. The first 8 acres have done well and in the balance only partial success has been achieved.

163. 1940—88 *acres and* 1943—3 *acres.*—The above species were introduced. This is fairly successful though some portions are not as good as 1939 area.

164. In 1942, 84 acres near Jaganathankombai were allotted. Since the kumridars worked half-heartedly, the tree crop failed.

165. In 1943, another area of 22 acres touching the above area was given to the kumridars and the tree crop in this area was not satisfactory.

166. In 1947, 120 acres were allotted to Kumridars. Due to late sowing, full success was not achieved.

167. *Thalli Extension Reserved Forest* 1940 (*near Gummalapuram*).—This area was allotted to kumridars in 1940. It contained dense lantana and spiked sandal. Mahogany seedlings obtained from Palghat were planted at 18 feet by 18 feet, but at all died. Seeds of *Albizzia lebbeck, Acacia ferruginea* and *Neem* were sown. Subsequently, *Zizyphus jujuba* was also sown. The area is successful.

168. *Sanamavu Reserved Forest.*—As per prescription of the old working plan, an area of 20 acres were regenerated with *Cassia siamea* and *Albizzia amara* from 1935 to 1938 at the rate of 5 acres each year, with an espacement of 6 feet by 6 feet. The Chief Conservator of Forests inspected this area on 1st April 1938, and found the above to be a failure and ordered to dibble cashew in pits one foot cube at an espacement of 6 feet by 6 feet. These have not proved successful.

169. In 1942, an area of 4 acres was given to kumridars and dibbled cashew and other fuel species. The area proved a failure.

170. In 1941, another area 3·7 acres in Coupes III and VII was allotted to kumridars and fuel species seeds were sown. Resowing was done in 1943. In 1944, the results were very poor.

171. *Marandahalli Reserved Forest.*—In 1939, an area of 9 acres was given for kumri and seeds of fuel species. This area was successful.

172. *Gulhatti Reserved Forest.*—In 1940, an area of 6·55 acres was given to kumridars. Fuel species were raised.

173. *Minor forest produce kumris.*—A scheme for Kalapambodi and Masakal was prepared by Mr. H. R. M. Law, sanctioned in Chief Conservator's No. 6401/38-D 1, dated 19th June 1939. Accordingly, 50·5 acres in Masakal was given out to kumridars in 1939. Fuel species seeds in lines 4 feet wide and 22 feet apart were sown. The kumridars were very negligent and indifferent and this area was a failure. Hence, seeds of cashew, soapnut and tamarind were sown. In 1942, the kumridars damaged area. Hence the kumri was abandoned.

174. In 1940, an area of 66 acres in Kalappambodi was kumried and tamarind was sown in alternative lines with Zizyphus, Sapindus and cashew in pits of one foot cube, 22 feet apart. Only tamarind was successful. Therefore all failed pits were re-sown with tamarind. In 1941, no kumridar came forward and in 1942, another area of 52·77 acres outside the area proposed by Mr. H. R. M. Law (sanctioned in Conservator's No. 1116/39-C, dated 20th February 1942) was given and, in October 1943, tamarind was sown in pits of one foot cube, and 22 feet apart. This gave 68 per cent success. In 1945, another area of 12 acres was given to kumridars and the results were encouraging.

175. *Pennagaram Reserved Forest.*—In 1941, 24 acres were given to kumridars but they left the area objecting to the lay out of 6 feet square plots 26 feet from centre to centre. This area was allotted later to small pattadars and tamarind was introduced in pits 22 feet apart. The area was satisfactory.

176. In 1943, another area of 30 acres was given to kumridars and tamarind was introduced. The kumridars did not evince much interest and, consequently, they were evicted. The area was not successful.

177. *Nandibanda Reserved Forest.*—In 1941, about 23 acres; in 1942, 5 acres; in 1943, 30 acres; and in 1945, 30 acres, respectively, were successfully kumried with minor forest produce species.

178. *Manure leaf kumri.*—Under the scheme prepared by Mr. A. A. Khan and sanctioned in Conservator's 1841/42-C, dated 4th October 1942, an area of 5 acres was kumried in 1938 and *Cassia siamea*, *Poinciana elata*, and *Dodonaea viscosa* were raised successfully. *Poinciana elata* cuttings were also planted. Another area of 5 acres was also kumried similarly in 1939 and the results were good. Eight acres in 1940 and 9 acres in each of 1943 and 1944 were also kumried.

SECTION 3—SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN.

179. *Control measures for arresting the spread of spike.*—Spike disease was first observed in this division in the Javalagiri reserve in October 1913. Attempts to prevent the spread of the disease were made by uprooting all sandal trees, both healthy and spiked, for a radius of two furlongs around the infected area. Accordingly 6,500 trees were removed from this area during 1913. In February 1914, however, inspection revealed that the disease had appeared in a new area adjacent to the first one. This area also was treated similarly but again the treatment proved to be ineffective. In May 1915, a case of spike was noticed for the first time in the Thalli reserve. Preventive measures of the kind described above were carried out in 1915–16 over an area of 190 acres in that reserve. In this case, in addition to uprooting all the sandal trees on the area, all *Zizyphus oenoplia* climbers were also eradicated. In the Javalagiri reserve the practice of removing healthy trees from infected areas was given up in 1915–16 under the Conservator's orders, in view of its obvious ineffectiveness, and spike control resolved itself into the elimination of actually infected trees. The method, however, continued to be applied to other areas. In the Tholavubetta reserve where Mr. Wilson observed spike in 1914 and 1915, all sandal trees and *Zizyphus oenoplia* plants were removed in an area lying within a radius of 2 furlongs around the infected locality. When this practice was given up is not known but in later years only spiked trees, whether living or dead, were extracted. Since 1927 only completely dead trees have been removed.

180. The Indian Institute of Science has recently evolved a new technique for the control of spike in areas where it makes its first appearance. The method consists in lopping all sandal trees over a small radius (200 yards) around the infected trees. This has the effect of forcing trees which may have been infected, but which mask the disease to manifest the symptoms. Such trees as show the disease are immediately killed by poison, as it is known that even disease-making trees are capable of acting as centres of infection. The principle of the method thus consists in the rapid detection and destruction of all sources (diseased trees) of secondary spread of spike. This method has been applied successfully to new attacks of the disease in Denkanikota, Naganur, Galigattam and Guttirayan reserves, where a definite lowering of the incidence has resulted from this treatment as compared with control areas which were left untreated. The method has, however, serious limitations and is not altogether free from possible dangerous reactions on the disease resisting powers of the residual growing stock. It is, for instance, obviously unsuited to

regions where spike is already diffused over a wide area, as the chances of re-infection from adjoining diseased areas are great. The control operations were closed in 1942 except one plot in Hudedurgam which also was closed subsequently.

181. *Lac cultivation.*—In response to a reference from the Chief Conservator (No. 2627/27, dated 22nd March 1927) calling for proposals for experiments in lac cultutre, the District Forest Officer suggested that a small experiment might be carried out in the Thalli reserve near Devarbetta, with *Shorea talura* as host. Two experiments were carried out in that reserve in 1927 in collaboration with the Deputy Forest Utilization Officer, Mr. Hafiz.

182. The first experiment was with the monsoon crop. Thirty-five pounds of brood-lac, obtained free of cost from Narasimharajapura in Mysore State, were inoculated on selected Shorea coppice and other shoots on 13th July. Swarming was fairly brisk in the beginning, especially on clear, sunny days and rapid settlement took place. The stick-lac was removed from the shoots on 11th August. About the middle of August the insects showed signs of mortality and in another month 50 per cent of them were dead. The cause of this heavy mortality was not definitely known. It was ascribed to poor stock, unsuitable hosts, defective choice of shoots and preponderance of insect enemies. The emergence of the male insects of lac was first noticed on 13th September and went on for nearly a fortnight. A week prior to the male swarming, numerous parasitic cocoons were noticed and the larvae were indentified to be those of the predators *Eublemma amabilis* and *Holcocera pulvera* and of a parasite which was a *Chalcid* fly. The lac was harvested on 20th November and yielded 16 lb. of brood-lac. The crop was definitely a failure.

183. The second experiment was with the post-monsoon crop. As it was suspected that the poor results of the first experiment might have been due to the use of unhealthy stock and to the low vitality of the ground coppice shoots inoculated, the brood-lac, for this experiment was carefully selected by Mr. Hafiz from four trees in Bannirghatta near Bangalore and inoculated on vigorous pollard shoots of poles which had been pruned in March 1926. Forty pounds of brood-lac were inoculated on 112 shoots (12 poles) in three separate areas on the 9th and 10th November. The stick-lac was removed on the 27th and 28th of November, after a shorter period than in the first experiment, in order to minimise the risk of the predators and parasites breeding out of the imported brood-lac. Male emergence commenced on 25th January and continued for a fortnight. Predators and parasites which were observed were again identified as *Eblemma* and *Chalcid* and were kept under control by hand picking. Early in March a new danger was observed ; rats began to eat the lac incrustation on the branches. The trees were protected by tying thorns around the stems, but only the thorns of *Barleria* spp. was found to be effective in keeping the rats away. The damage by rats was so severe that in one week the whole crop on 60 saplings was destroyed. Fortunately the damage was confined to only one area and the other two were protected successfully. The lac was harvested on 26th March 1928. The Lac Adviser to the Government of Mysore visited the experimental areas and described the lac crop as one of the best he had seen. The brood-lac obtained from the crop weighed 160 lb.

184. The main object of the experiments was to ascertain the climatic suitability of the North Salem forests for the cultivation of lac, and to give demonstration to the local staff of the methods of successful lac cultivation. They were not conceived on a commercial scale ; nevertheless the results of the second experiment showed a four-fold increase of the seed used. They definitely proved that lac cultivation could be successfully undertaken in North Salem.

185. The effect of pruning in different seasons and various localities was studied. Nearly, 1,500 poles were pruned in varying degrees of intensity during different months and kept under observation. The results indicated that in order to be suitable for lac cultivation *Shorea* trees should be pruned two or even three years in advance.

186. The coppicing capacity of *Shorea talura* was experimented in 1940. It was observed that these trees produced on an average of 32 shoots per stool, with an average inoculable length of 172 inches. But, it was observed that many of these shoots were so close to the ground that it was difficult to protect the lac from the attack of predators and other enemies.

187. Lac cultivation was slightly expanded after the second experiment, but the experimental basis was still preserved. The following is a brief account of further work done.

188. The third experiment was with the pre-monsoon crop and local brood derived from the previous crop was used. The quantity of brood-lac used was 130 lb., and 399 shoots and poles (including a dozen lopped trees) occuring in seven different patches were inoculated between 28th March and 1st April 1928. Male emergence started on 18th May and continued for 20 days. Swarming began on 16th July on the 113th day after inoculation and the lac was cut. The yield was 508 lb. of which 30 lb. were rejected as useless and the balance was used for inoculation of the monsoon crop.

189. *Lantana control.*—Experiments were carried out by the following methods :—

(*a*) Spraying chemicals.
(*b*) Poisoning with Arsenic.
(*c*) Under planting lantana with bamboos.
(*d*) Under planting lantana with *Griptostegia grandiflora* (rubber tree).

(*a*) *Spraying chemicals.*—The following chemicals were used in spraying lantana in Noganur Reserved Forest.

	Name of chemical.	Strength of solution.
1	Ammonium thixynate	100 grammes per gallon of water.
2	Potassium chlorate	Do.
3	Sulphuric acid	1 oz. to 1 gallon of water.
4	Ethylene chloroxyelin	6 oz. to 1 gallon of water.
5	Copper sulphate	4 oz. to 1 gallon of water.
6	Magnesium chloride	Do.
7	Atlas tree Killu solution	1 to 20 parts of water by volume.
8	Atlas substitute solution	Do.
9	Aluminium sulphate	50 grammes to 1 gallon of water.
10	Arsenic acid	4 oz. to 1 gallon of water.
11	Potassium thiocynate	Do.
12	Sodium chlorate	$\frac{3}{4}$ lb. to 2 gallons of water.
13	Sodium chlorate	$\frac{1}{2}$ lb. to 2 gallons of water.

Of the above, items 3, 4, 5, 6 and 9 had no effect at all. Under items 1 and 11, the lantana shed its leaves but shot up again quickly. Under items 2 and 10, the lantana shed its leaves and the top twigs up to a length of one to two feet died but it shot up again quickly from below. Under items 7 and 8, the effect was very thorough in the beginning as all leaves and shoots up to $2\frac{1}{2}$ to 3 feet long died but it had no effect on the seed lying dormant in the ground and the stools shot up again showing that the roots had not been affected.

Items 12 and 13 were found to be effective on lantana.

In 1935, 10 gallons of sodium chlorate solution prepared with $\frac{3}{4}$ lb of the chemical to 2 gallons of water and was sprayed per acre on 27th March 1935. By 28th May 1935, 50 per cent of lantana was dead. Shoots and seedlings reappeared from thick stems not killed. Again 6 gallons per acre of the above solution was sprayed on 1st September 1935. By February 1936, all lantana had died.

In 1936, another plot was chosen and all lantana was cut at ground level early in May and heaped. The heaps were burnt 15 days later. By August, coppice regrowth and seedlings from dormant seeds was profuse. Spraying was done in August and the leaves were noticed to wither the same day. Within 5 to 7 days all leaves withered completely and top twigs up to 3 feet to 4 feet dried up. Regrowth came up after 15 to 20 days and another spraying with the same solution was done in the first week of December and the regrowth was killed. About four months later, in March, another spraying was done to kill all the scattered lantana regrowth.

Six gallons of the above solution for the first spray, 3 gallons for the second and $1\frac{1}{2}$ gallons for the third spray were used per acre.

In 1937, another experiment by spraying with lighter solution was carried out. The solution contained $\frac{1}{2}$ lb. of the chemical to 2 gallons—sixteen gallons of solution were sprayed per acre on 11th and 12th August 1937. By 19th August 1937, the lantana had started dying. Rain in the last week of August and in the months of September and October brought back a profuse regrowth of lantana. Another spray of 10 gallons of solution per acre in the first week of December was done. By 18th January 1938, most of the lantana had died. The lantana was then burnt and the area regenerated with *Cassia siamea*.

In 1938 the lighter solution of sodium chlorate was introduced in another plot. Sixteen gallons per acre was sprayed in January. After two months 50 per cent of lantana was found dead. Profuse regrowth from stool shoots and seedlings of dormant seeds was observed. On 8th March 1938, ten gallons of solution per acre was sprayed and by middle of June, all lantana was dead.

In 1939, the same strength of solution was sprayed in another plot at 12 gallons per acre in January. By the end of February, all foliage, tops of shoots and branches died but stool regrowth and seedlings from dormant seeds were once again profuse. A second spraying at 1 gallon per acre was done at the end of February. The lantana was partly dead and it was burnt at the end of March.

After 1939, no experiment with sodium chlorate was tried.

(b) *Poisoning with Arsenic.*—An experiment by girdling lantana at a height of 1 inch to 3 inches above ground level and poisoning with Arsenic solution was tried. Though it completely killed all the existing growth, the seedlings which came up from dormant seeds were not affected.

(c) *Bamboos under planting.*—In 1936, the Research Ranger planted one year old bamboo seedlings at 6 feet by 6 feet under dense lantana in Aiyur reserve. Casualties were replaced in 1937 and 1938. This experiment was a success.

Another area of 5 acres was planted similarly, but with, wider espacement of 18 feet by 18 feet. In this case the lantana is not completely absent but very much under check.

Towards the close of 1928, owing to the fact that the expansion of cultivation had not kept pace with the successful and rapid multiplication of the brood, a fraction of which only was required for maintaining production in North Salem, it became urgently necessary to dispose of the surplus brood-lac in advance of the swarming. Advertisements in the newspapers produced no results, nor was the Utilization Branch able to secure any offers. The difficulty lay in the fact that lac cultivation on *Shorea* was practically confined to Mysore State which offered no more than Re. 1 for 10 lb. of selected brood or 15 lb. of unselected brood. This price was too low and it was finally decided to lend 1,168 lb. of brood to the Mysore State and 500 lb. to the Indian Institute of Science on the conditions that (1) the 'phunki' lac (stick-lac collected after the emergence of lac insects) should be returned to North Salem and (2) Mysore should supply an equal quantity of brood-lac, whenever required free of cost, subject to return of the 'phunki' lac to Mysore after inoculation.

The work done up to the middle of 1929 was reviewed by the Chief Conservator in his Proceedings Mis. No. 270, dated 30th July 1929. He considered that the experiments made showed that successful lac cultivation was possible in North Salem and that the stage had arrived when the work should be entrusted to the district staff for continuance on a commercial basis with a careful record of costs from 1st April 1930. It was decided that the Phunki lac should be marketed through the agency of the Lac Factory at Bangalore.

A working scheme for the lac operations in North Salem was prepared by Mr. Abdul Hafiz, Deputy Forest Utilization Officer, in 1928. This scheme outlined a framework under which the areas containing *Shorea talura* were allotted to two series, namely, the Thalli and the Denkanikota series, each of which was to be divided into nine coupes. One coupe in each series was to be taken up in rotation for lac cultivation each season. As inoculation could only be done 2 to 3 years after pruning the *Shorea* trees, this period being necessary for the proper development of the shoots, a tentative rotation of three years was adopted. There crops can be raised in a period of 13 months, so that at the end of the rotation 8 crops would have been realised. The following pruning and infection operations were prescribed :—

Number of coupe.	*Pruning period.*	*Crop to be raised.*	*Time of first infection.*
(1)	(2)	(3)	(4)
I	July–August 1929	Pre-monsoon	April 1932.
II	Do.	Monsoon	July 1932.
III	November-December 1929	Post-monsoon ..	November 1932.
IV	July–August 1930	Pre-monsoon	April 1933.
V	Do.	Monsoon	July 1933.
VI	November–December 1930	Post-monsoon ..	November 1933.
VII	July–August 1931	Pre-monsoon	April 1934.
VIII	Do.	Monsoon	July 1934.
IX	November–December 1931	Post-monsoon ..	November 1934.

The scheme did not define the limits of the coupes, but left it to be done after enumeration of all *Shorea talura* trees in the division. A complete enumeration carried out by the district staff showed over 32,000 trees standing in the reserves of the Hosur plateau. The pruning of the trees was done regularly as laid down in the scheme as follows :—

Year.	*Locality.*	*Number of trees coppiced.*	*Number of trees pruned.*	*Total.*
(1)	(2)	(3)	(4)	(5)
1929–30	Thalli and Extension, Javalagiri, Hulibanda, and Pane reserves.	1,459	10,184	11,643
	Thalli, Javalagiri, Aiyur reserves and Jalarigutta.	39	1,232 (for experimental purposes).	1,271
1930–31	Thalli, Denkanikota and Aiyur reserves ..	1,667	9,518	11,185
1931–32	Thalli, Aiyur, Gulhatti. Marandahalli, Galigattam, Tholavubetta and Pane reserves.	1,645	11,351	12,996
	Total ..	4,810	32,285	37,095

Under the provisions of the working scheme full scale commercial working should have been introduced in 1932. In view, however, of the serious slump that had taken place in the price of lac as a result of the general trade depression, and the difficulties encountered in marketing the lac already produced, it was decided that the time was not propitious for any expansion of production and that the work should be maintained at a level that would permit of rapid expansion if conditions improved.

In Mr. Ranganathan's working plan the *Shorea talura* Working Circle was divided into, Javalagiri series and Thalli series, containing 17,916 and 20,780 trees respectively. Pruning two and a half years in advance was prescribed and a rotation of 2 years and 8 months for 8 crops was fixed.

Pruning was done in 1934, but the work was not taken up on a commercial scale due to fall in prices.

The cultivation was left with the territorial staff.

190. *Fire protection.*—The system of fire protection vogue prior to the introduction of the Hosur Sandal Working Plan (1917) was that of clearing and fire-tracing a network of fire lines over the division. The working plan hoped that with the gradual introduction of the village grazing schemes which it advocated, the necessary protection against fire would be afforded by the local villagers. It prescribed that until such schemes were evolved—this object was in fact never realised—the existing method of fire protection by means of line burning and fire patrols should be continued. The disposition of the original system of fire lines probably had reference to the numerous "specially protected blocks" which Mr. Wilson's plan threw open to grazing with a view to reducing the danger of fire in such blocks. The plan made no change in the lay out of the lines but provided for their widening to a uniform width of 30 feet. The total length of these lines was 106 miles 2 furlongs; they were confined to the Denkanikota and Anchetti ranges and for the most part followed either reserve boundaries or footpaths. The work of widening the lines was completed between the years 1917 and 1920 at a cost of over Rs. 800 and the prescriptions of the plan were followed regularly till 1926. In that year Mr. Hart (then District Forest Officer) introduced significant changes in the fire protection operations. As already noted, he threw open to grazing the closed *Hardwickia* blocks along the Cauvery, hoping thereby to reduce the intensity, if not the incidence, of fires in those areas. He limited the work to the *clearing* of the lines where it was necessary and gave up burning them, as he was convinced that a large proportion of the fires which occurred was due to injudicious burning of the lines, which started uncontrollable fires in lantana and grassy areas. He stopped the empolyment of fire patrols. These departures from the prescribed practice were made on his own responsibility. In 1928 on a reference from the District Forest Officer, the Conservator directed that the prescriptions of the working plan should be adhered to. Accordingly, in the year following the lines were burnt and fire patrols were appointed. In 1930, Mr. Mitchell reported that the employment of fire patrols was a waste of money, as they neither prevented nor detected any offences and the Conservator ordered that fire patrols need not be employed and that the boundaries (of the reserves ?) should be cleared and burnt wherever necessary. This meant a definite break from the methods of fire protection laid down in the working plan. Since 1930 it has been the practice to clear but not to burn the firelines, although during 1933 and 1934 a few foot-paths passing through *Hardwickia* areas in Anchetti range have been fire traced as a special case. A noteworthy point is that early burning has never been done in North Salem; a proposal to introduce it on the Cauvery slopes in 1932 was rejected by the Chief Conservator.

191. In Cauvery range, the greater part of the forests were, in the past, getting burnt almost every year and the only tree that survived was *Hardwickia binata*. Periodical burning was, therefore, undertaken departmentally either biennially or triennially in blocks on a rotation, with the willing co-operation of the graziers and thus to improve the grass.

192. In Krishnagiri range, the fire protection operations were carried out on the lines prescribed in the Working Plan for West Vellore division by Mr. A. R. Brand.

193. In G.O. Mis. No. 1816, Development, dated 25th October 1929, Government permitted the closure to grazing of areas where such closure was silviculturally necessary. As a corollary of this order the Chief Conservator issued instructions that areas which were burnt should be immediately closed for a period long enough to permit the growing stock to recover from the damage done by the fire. In 1930 a fire occurred over an area of 740 acres in the Kestur Extension reserve and in pursuance of the above instructions Mr. Mitchell proposed the closure of the whole reserve (6,361 acres) for a period of one year from 1st July 1930. This was approved. In spite of the closure, over 6,000 acres of the closed area were

burnt in 1931 and the continuance of the closure for another year was ordered. In April 1932, some three months before the closure was due to expire, Mr. Littlewood inspected the area and found it submerged in " a sea of tall grass " and recommended that it should be opened to grazing immediately as a measure of fire protection, especially as the local villagers expressed willingness to keep out fire. His proposal was accepted by the Chief Conservator who, however, directed that the area should be " instantly and permanently closed " to grazing on the recurrence of fire. In February 1933 a fire covering 10,000 acres occurred in the Kestur and Kestur Extension reserves. In (partial) conformity with the Chief Conservator's orders, the area was closed for a further period of two years from 15th April 1933. One year of this last closure has now gone by. Inspection of the reserves in March 1934 showed dense, almost impenetrable masses of tall grass in all parts of the closed area, which gravely increased the risk of fire and of the damage in the event of fire. A fire did occur at the time of inspection and swept over a vast area, notwithstanding the unremitting efforts of the Range Officer, of his special fire protective establishment headed by a Forester and of the local villagers who rendered willing assistance. Towards the end of March the outbreaks of fire became so frequent that it proved impossible even to attempt to put them out. The history of this closure has been dealt with at some length because we believe it holds a salutary warning against prolonged closure which tends to defeat its object.

194. Thus it was prescribed in Mr. Ranganathan's working plan that certain footpaths and boundaries should be only cleared and not burnt compared with previous fires, during the period of Mr. Ranganathan's plan, no appreciable difference was noticed in the areas burnt. A comparative statement on fires from 1926 to 1933 with those of 1935 to 1942 is appended.

Year.	From 1926 to 1933, area burnt in acres.	Year.	From 1935 to 1942, area burnt in acres.
1926	20,864	1935	628
1927	15,804	1936	2,124
1928	40,843	1937	34,407
1929	17,569	1938	45,108
1930	27,951	1939	Not available.
1931	26,173	1940	11,000
1932	944	1941	22,330
1933	19,390	1942	8,675

195. *Roads and buildings.*—The following are the new roads and buildings which were constructed in 1938–39 and 1939–40. All the items of new roads and buildings proposed in Mr. Ranganathan's working plan were not constructed due to World War II.

List of roads actually constructed in Salem North Division between the years 1935–36 *and* 1948–49.

Serial number and name of range.	*Name of road.*	*Necessity for road.*	*Year of construction.*	*Length in miles.*	*Cost.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
				M. F.	RS. A. P.	
1 Denkanikota East	From Gulhatti to Manchi road ..	For extraction of bamboos from Gulhatti and Manchi series.	1938–39 and 1939–40.	2 7	1,327 14 0	The road is 8 to 9 feet wide and it is unmotored.

List of buildings constructed in Salem North Division during the years 1935–36 *and* 1947–48.

Serial number and name of range.	*Locality.*	*Kind of building.*	*Reason for construction.*	*Recommended year of construction.*	*Estimated cost.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
					RS.	
1 Anchetti	Ootamalai	Forest Guards' quarters ..	For residence ..	Not recommended in Working Plan, but constructed during 1938.	678	
2 Dharmapuri	Dharmapuri	Foresters' quarters ..	Do. ..	Not recommended in Working Plan, but constructed during 1937–38 and 1938–39.	325	This building was subsequently converted into a sandalwood godown during 1942–43 and improvements effected at a cost of Rs. 102.
3 Denkanikota East ..	Gulhatti	Forest Guards' quarters ..	Do. ..	Not recommended in Working Plan, but constructed during 1938–39.	747	
4 Do. ..	Denkanikota	Motor lorry shed ..	....	Not recommended in Working Plan, but constructed during 1939–40.	..	

The following are lists of roads, buildings and wells maintained in the North Salem Division :—

List of roads maintained by the Forest Department—North Salem Division.

Serial number and name of the road.	Date of construction.	Capital cost.	Length. Within the reserved forest.	Length. Outside the reserved forest.	Length. Total length.	Whether metalled or not.	Cost of annual repairs. 1943–44.	Cost of annual repairs. 1944–45.	Cost of annual repairs. 1945–46.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		RS. A. P.	M. F.	M. F.	M. F.		RS. A. P.	RS. A. P.	RS. A. P.	
					Denkanikota East Range.					
1 Denkanikota-Aiyur road.	1904	4,144 0 0	0 1	8 5½	8 6½	6½ miles metalled.	947 7 0	629 8 0	1,029 12 6	12 feet to 14 feet converted as per District Forest Officer's orders No. 2835/39, dated 19th August 1939.
2 Aiyur-Gulhatti	1928 1934	1,566 0 0 328 0 0	3 0	1 4	4 4	4 furlongs metalled.	464 2 9	250 0 0	284 3 0	Breadth 14 feet.
3 Aiyur-Sameri	1927	99 0 0	2 7	0 6	3 5	Not metalled.	47 11 0	49 11 0	76 11 0	Breadth 12 feet.
					Denkanikota West Range.					
4 Devarabetta-Gopasandiram.	1927	709 0 0	. .	2 3	2 3	Not metalled.	40 3 0	62 9 0	52 0 0	Breadth 10 to 15 feet.
5 Thalli-Javalagiri . .	Handed over by Local Fund Department in 1927.	2,144 0 0	. .	5 0	5 0	Do.	905 8 0	735 4 0	695 0 0	Breadth 20 feet.
6 Approach road to Javalagiri.	1929	150 0 0	. .	0 6	0 6	Do.	18 10 0	15 14 0	19 5 0	Breadth 12 feet.
7 Kundukota-Anchetti . .	1893	1,289 11 0	4 7	1 6	6 5	Do.	3,450 14 0	2,020 8 0	1,588 7 0	Average width 8 feet.
					Dharmapuri Range.					
8 Anaibiddamaduvu-Pennagaram.	1905	6,866 0 0	9 4	2 0	11 4	Not metalled.	1,729 15 0	1,677 12 0	3,298 15 0	9 feet to 14 feet.
9 Approach road to rest-house Hogainakal.	1915	50 0 0	0 2	. .	0 2	Do.	. .	. .	. .	
					Anchetti Range.					
10 Hogainakal-Biligundlu . .	1914	3,195 0 0	6 2	. .	6 2	Not metalled.	118 9 0	112 10 0	105 11 0	Transferred to Anchetty range from 1st April 1941.
11 Anchetti-Anaibiddahalla.	1910	18,320 0 0	10 4	3 4	14 0	Do.	1,220 10 0	899 13 0	796 8 0	Average width 12 feet.
12 Anchetti-Taggati . .	1927	1,741 0 0	3 2	4 3	7 5	Do.	164 8 0	227 7 0	173 12 0	Do.
13 Branch road to Gerhatti rest-house.	1927	45 0 0	0 5	0 1	0 6	Do.	10 2 0	13 14 0	14 5 0	Do.
					Denkanikota East Range.					
14 Gulhatti-Manchi . .	1938–39	1,327 0 0	2 7	. .	2 7	Not metalled.	88 6 0	90 0 0	132 11 0	
15 Sameri-Siddapuram bridle path.	1933	80 0 0	4 0	. .	4 0	Do.	10 0 0	10 0 0	. .	Width 8 feet.
					Krishnagiri Range.					
16 Medugampalli-Poongamothi	1912	633 0 0	2 0	2 4	4 4	Not metalled.	. .	. .	. .	10 feet wide. Transferred from West Vellore Division from 1st April 1939.

List of buildings in North Salem Division.

Serial number and name of building. (1)	Year of construction. (2)	Capital cost. (3) RS.	By whom used. (4)	Nature of the building. (5) Walls.	Roof.	Floor, etc.	Remarks. (6)
				Denkanikota East Range.			
1 Range Officer's quarters at Denkanikota.	1898	1,500	Range Officer, Denkanikota East as residence.	Mud	Country tiles	Square tiles.	
2 Out-house, kitchen ..	1898	850	Do.	Burnt brick in mud.	Do.	Concrete with chunam.	Converted into double lock godown with effect from 22nd January 1940. C.C.P. Mis No. 18, dated 10th January 1941.
3 Latrine (attached to Range Officer's quarters).	1898	50	Do.	Random rubble in clay.	No roofing	No flooring	
4 Aiyur rest-house	1908	1,000	Touring Officers ..	Burnt brick in mud ..	Country tiles	Square tiles	C Class Bungalow.
5 Out-house (kitchen, servants' room, 2 stables, Syee's room).	1909 and 1927.	460	Do. ..	Do. ..	Do.	Concrete in chunam.	Attached to rest-house, Aiyur.
6 Latrine	1926	50	Do. ..	Sun-dried brick in mud.	Zinc sheet	Mud.	Attached to rest-house, Aiyur (re-built in 1930 at a cost of Rs. 40).
7 Sandalwood godown at Aiyur (two rooms 15′ × 12′).	1918	1,328	Storing sandalwood ..	Burnt brick in mud ..	Country tiles	Stone slabs	
8 Foresters shed at Aiyur ..	1929	235	By Foresters as residence.	Mud	Do.	Mud.	
9 Inspection shed, Siddapuram.	1926	557	Touring Officers ..	Sun-dried brick in mud.	Do.	Concrete in chunam.	C. Class bungalow.
10 Out-house	1926	97	Do. ..	Mud	Thatched	Mud.	
11 Latrine	1938	69	Do. ..	Burnt brick in clay ..	Country tiles.. ..	Concrete in chunam and plastered with cement.	
12 Inspection shed at Gulhatti.	1926	590	Do. ..	Sun-dried brick in mud.	Do.	Concrete in cement.	
13 Out-house	1926	120	Do. ..	Do.	Do.	Do.	
14 Latrine	1938	69	Do. ..	Burnt brick in clay ..	Do.	Concrete in lime and plastered with cement.	
15 Inspection shed at Manchi.	1926	610	Do. ..	Sun-dried brick in mud.	Do.	Concrete in chunam ..	C. Class bungalow. Written off in Conservator, Salem Circle No. 16/45, dated 20th February 1945.
16 Out-house	1926	100	Do. ..	Do. ..	Do.	Do. ..	Attached to Inspection shed at Manchi.
17 Sandalwood godown, Sunanapalli.	1922	2,155	Storing sandalwood ..	Burnt brick in mud ..	Do.	Stone slabs	(Two rooms 15′ × 12′ with a front verandah).
18 Inspection shed at Sivanapalli.	1928	212	Inspection shed ..	Mud	Do.	Mud	Foresters' quarters converted into non-residential building. Non-residential building to be permitted as a residence for Foresters on duty on payment of usual rent whenever required.
19 Forest shed at Gonanakarapalli.	1928	212	As a residence by Forest Guard.	Mud	Country tiles	Do.	
20 Range office, Denkanikota East.	1921	460	Used as double lock room.	Burnt brick in mud ..	Do.	Square tiles	Converted into double lock rooms from 1st July 1941.
21 Sandalwood godown at Denkanikota.	1906 1931	1,214	Storing final cleaned sandalwood.	Rough stone in mud.	Do.	Stone slabs	Two rooms 15′ × 12′.
22 Sandalwood storing shed ..	1902	452	Storing sandalwood (R.C.).	Burnt brick in mud ..	Do.	Concrete in chunam ..	Orignially stables for Range Officer's quarters.

23 Bullock shed	1912	260	Do.	Rough stone and burnt brick in mud.	Do.	Mud.	
24 Final cleaning shed	1918 1931	1,455	For final cleaned sandalwood.	Expanded metal	Do.	Stone slabs.	
25 Temporary shed	1937	358	Do.	Rough stone mortar one side wall is compound wall and not built for this shed.	Zinc sheet	Mud.	
26 Compound wall, Denkanikota East.	1901 1910	2,474 239	Compound wall	Rough stone in mud	....	....	The compound wall round forest compound depot was wire fenced.
27 Timber shed	1906 1927 1928	903	Storing rough sandalwood.	Sun-dried brick in mud.	Country tiles	Concrete in chunam.	
28 Forest guard's quarter at Gulhatti.	1939	747	Forest guard's Gulhatti.	Burnt brick in clay on random rubble in lime mortar foundation.	Tiled roofing tiles over flat tiles with lime mortar border.	4 feet of concrete stone in lime mortar rubbled over with cement.	
29 Motor lorry shed	1940	359	For lorry	Burnt brick in clay	Pot tiles in bamboo reepers.	Flooring with cement.	
30 Deputy Tahsildar buildings at Denkanikota.	1908	RS. A. P. 5,129–14–0	Used as Range Office for Range Officer, Denkanikota East and West Ranges and double lock rooms.	Brick in mud	Tiled	Square bricks	Transferred to this Department in G.O. Ms. No. 2796, P.W.D., dated 13th December 1940.
31 Rest-house	1924	RS. 2,627	Touring Officers	Do.	Country tiles	Square bricks	The rest house which was in Denkanikota West range was transferred to Denkanikota East with effect from 12th January 1945.
32 Out-houses	1927	880	Do.	Do.	Do.	Concrete in chunam	Do.
				Denkanikota West Range.			
1 Range Officer's quarters, Denkanikota West.	1927	2,347	Range Officer, Denkanikota West as residence.	Sun-dried brick in mud.	Mangalore tiles	Square bricks.	
2 Out-house	1927	373	Do.	Burnt brick in mud	Do.	Mud.	
3 Latrine	1930	63	Do.	Burnt brick in clay	....	Concrete in cement.	
4 Rest-house at Javalagiri	1914	1,615	Touring Officers	Burnt brick in mortar.	Country tiles	Square tiles.	
Kitchen	1914	300	Do.	Burnt brick in mud	Do.	Concrete in chunam.	
5 Servants' quarters	1914	460	Do.	Do.	Do.	Do.	
6 Motor garage	1933	340	Do.	Mud	Do.	Mud.	
7 Sandalwood godown at Javalagiri.	1918 1928	1,396	Storing sandalwood	Burnt brick in mortar.	Do.	Stone slabs.	
8 Foresters' quarters at Javalagiri.	1928	308	Vacant	Sun-dried brick in mud.	Do.	Mud	Occupied by the Forester from 10th February 1934.
9 Sandalwood godown at Devarbetta.	1922	1,769	Storing sandalwood and the other room as residence by Forester.	Burnt brick in mortar.	Do.	Stone slabs.	
10 Inspection shed, Sulakunta.	1925	717	Touring Officers	Sun-dried brick in mud.	Tiled	Concrete in chunam.	
11 Out-house	1925	100	Do.	Do.	Thatched	Mud.	
12 Inspection shed at Devarbetta.	1929	734	Do.	Sun-dried brick in clay.	Mangalore tiles	Concrete in chunam.	
13 Kitchen	1929	211	Do.	Do.	Do.	Mud.	
14 Garage and servants' quarters.	1929	465	Do.	Burnt brick in clay	Country tiles	Concrete in chunam.	
15 Latrine	1937	92	Do.	Cub stone in mud	Do.	Concrete in chunam and rubbles with cement.	
16 Temporary shed at Belakarai.	1936	Free of cost.	....	Flattened bamboos	Thatched	Mud.	

Serial number and name of building.	Year of construction.	Capital cost.	By whom used.	Nature of the building. Walls.	Roof.	Floor, etc.	Remarks.
(1)	(2)	(3)	(4)		(5)		(6)
		RS.					
				Anchetti Range.			
1 Range Officer's quarters, Anchetti.	1915	2,910	Range Officer, Anchetti as quarters.	Burnt brick in chunam.	Country tiles over flat tiles.	Square brick with cement painting.	
2 Kitchen	1903	60	Do.	Mud plastered with lime.	Country tiles	Square bricks.	
3 Stables	1903	40	Do.	Do.	Do.	Mud.	
4 Range Officer, Anchetti ..	1915	2,143	Range Office	Burnt brick in mortar.	Do.	Square brick	The eastern half of the building was dismantled due to earth tremor and reconstructed at a cost of Rs. 882–12–0.
5 Compound Wall	1903	915	Compound wall ..	Sun dried brick ..	....	....	
6 Sandalwood godown, Anchetti	1918	1,438	Storing sandalwood ..	Burnt brick in mud painted with chunam.	Country tiles ..	Stone slabs.	
7 Rest-house at Anchetti ..	1913	2,590	Touring officers ..	Burnt brick in mud ..	Do. ..	Square bricks.	
8 Kitchen	1913	756	Do. ..	Do. ..	Do. ..	Do.	
9 Stables, etc...	1913	734	Do. ..	Do. ..	Do. ..	Mud and square bricks for the rooms.	
10 Latrine	1937	69	Do. ..	Sun-dried brick in mud.	Pot tiles over bamboo reepers and mats.	Concrete stone in chunam and rubbled with 20 lb. of cement.	
11 Rest-house at Natrapalayam.	1899	1,250	Do. ..	Do.	Country tiles	Concrete plaster with chunam.	
12 Kitchen	1915	630	Do.	Do.	Do. ..	Do.	
13 Stables and latrine ..	1915	409	Do. ..	Do.	Do.	Concrete plaster in mud.	
14 Out-house at Biligundlu rest-house.	1916	515	Do. (vacant).	Do.	Thatched	Mud.	
15 Rest-house at Urigam ..	1903	745	Do. ..	Do.	Country tiles	Cement.	
16 Out-house at Urigam ..	1903	555	Do. ..	Sun-dried brick in mud.	Do.	Square bricks and mud for slabs.	
17 Latrine	1938	74	Do. ..	Do.	Do.	Concrete in chunam and rubbled with 20 lb. of cement.	
18 Subordinate quarters at Urigam.	1926	832	Foresters at Urigam as residence Forest Guard half portion, watcher half portion.	Do.	Do.	Lime mortar over gravel.	
19 Inspection shed at Gerhatti.	1929	1,108	Touring officers ..	Burnt brick in clay ..	Mangalore tiles ..	Concrete in chunam.	
20 Out-house	1929	270	Do. ..	Do.	Do. ..	Do.	
21 Latrine	1938	71	Do. ..	Sun-dried brick in clay.	Country tiles	Cement.	
22 Forest guard's quarters at Oothmalai.	1938	678	Forest guard, Woddapatti.	Burnt brick in clay ..	Pot tiles over flat tiles. with.	Do.	
				Dharmapuri Range.			
1 Range Officer's quarters at Dharmapuri.	1904	1,951	Range Office, Dharmapuri as residence.	Burnt brick in mud. ..	Country tiles	Square brick in chunam.	
2 Kitchen	1905	370	Range Officer ..	Do. ..	Do.	Concrete in chunam.	
3 Stables	1905	500	Do. ..	Do. ..	Do.	Mud.	

4 Latrine	1907	150	Do. ..	Do.	Do.	Concrete in lime mortar.	
5 Compound wall	1906, 1939, 1940	1,408	As compound wall ..	Sun-dried brick in mud.	....	....	
6 Inspection shed at Pennagaram.	1905	1,165	Touring officers ..	....	....	....	Written off in Conservator's S.O. No. 76, dated 14th May 1941.
7 Kitchen	1905	150	Do. ..	....	....	....	Do.
8 Stables	1905	100	Do. ..	....	....	....	Do.
9 Inspection shed at Muthur.	1928	1,026	Do. ..	Burnt brick in mud ..	Country tiles	Concrete in chunam ..	Written off in Conservator's S.O. No. 113/46, dated 4th January 1946.
10 Out-house	1928	110	Do. ..	Mud	Do.	Square bricks and mud.	
11 Rest-house at Hogainakal.	1915	1,967	Do. ..	Burnt brick in mud ..	Do.	Cement and square bricks.	
12 Out-house	1915	349	Do. ..	Do. ..	Do.	Square bricks.	
13 Garage	1915	272	Do. ..	Do. ..	Do.	Mud.	
14 Servants' quarters ..	1916	541	Do. ..	Do. ..	Do.	Square bricks.	
15 Range Office and sandal godown.	1918	2,685	Range Office and storing sandalwood.	Do. ..	Do.	Office cement sandalwood godown stone slabs.	
16 Timber shed at Dharmapuri.	1926	245	Storing timber and sandalwood.	Mud	Do.	Mud	Written off in Conservator's S.O. No. 31/42, dated 1st June 1942.
17 Single lock godown	1938	RS. A. P. 427 6 0	For final clearing sandalwood.	Mud	Zinc	Stone slabs	Conversion of final clearing shed into single lock godown D.S.O. No. 146/42–43.
18 Subordinates quarters at Thoppur.	1915	RS. 484	Subordinates room Forest Guard Room No. 3, Room No. 4, Watcher.	Burnt brick in mud ..	Pot tiles for bamboo reepers.	Mud cement plaster.	Transferred from Police Department.
19 Subordinates quarters at Perumalai.	1923	1,186	Subordinates ..	Do. ..	Mat and pot tiles on wooden reepers.	Mud	Transferred from Police Department. Retransferred to the Police Department in Conservator's S. O. No. 79/42, dated 30th December 1942.
20 Subordinates quarters at Muthugampatti.	1909	30	Do. ..	Mud	Pot tiles	Rooms and verandah mud. Hall plastered with chunam.	Written off in Conservator's S.O. No. 57/42, dated 9th October 1942.
21 Subordinates quarters at Pennagaram.	1905	RS. A. P. 949 8 0	Forester two rooms. Forest Guard one room.	Burnt brick in mud.	Country tiles	Mud.	
22 Compound wall	1913	RS. 132	Compound wall ..	Mud	....	....	

Krishnagiri Range.

1 Inspection shed, Kodagarai.	1927	RS. 1,042	Touring officers ..	Burnt brick in mud ..	Country tiles	Cement	C. Class bungalow.
2 Out-house	1927	125	Do. ..	Mud	Thatch	Mud.	
3 Latrine	1938	56	Do. ..	Sun-dried brick ..	Country tiles	Concrete.	
4 Inspection shed, Gerigapatti	1927	859	Do. ..	Burnt brick in mud ..	Do.	Concrete with chunam.	
5 Out-house at Gerigapatti ..	1927	173	Do. ..	Sun-dried brick in clay.	Do.	Do.	
6 Sandalwood godown, Kodagari.	1920	40	Storing sandalwood ..	Mud	Thatch	Mud.	
7 Inspection shed at Marandahalli.	1913	388	Touring officers ..	Burnt brick in mud ..	Country tiles	Square bricks ..	C. Class bungalow.

Serial number and name of building.	Year of construction.	Capital cost.	By whom used.	Nature of the building. Walls.	Roof.	Floor, etc.	Remarks.
(1)	(2)	(3)	(4)		(5)		(6)
		RS.					
				Krishnagiri Range—cont.			
8 Out-houses at Maronhalli.	1913	100	Touring officers ..	Mud	Thatch	Mud	
9 Range Officers' quarters at Krishnagiri.	1899	2,060	Range office, Krishnagiri as quarters.	Burnt brick in chunam.	Country tiles	Square brick over concrete with chunam.	Transferred from West Vellore division from 1st June 1933. Retransferred to West Vellore Division from 1st April 1939.
10 Stables and servants' quarters at Krishnagiri.	1910	469	Range office, Krishnagiri.	Do.	Do.	Stables mud. Rooms chunam plaster.	Do.
11 Out-house attached to Range Officers' quarters.	1899	231	Used as kitchen by Range Officer, Krishnagiri.	Do.	Thatch	Mud	Transferred from West Vellore division from 1st June 1933. Retransferred from West Vellore Division from 1st April 1939.
12 Range Office	1923	2,340	Office	Burnt brick in mud ..	Country tiles	Square bricks. Record rooms Cuddapah slabs.	Do.
13 Rest-house at Medugampalli.	1912	2,529	Touring Officers ..	Do. ..	Do.	Cement	Do.
14 Out-house at Medugampalli.	1912	498	Do. ..	Do. ..	Do.	Stable in mud out-house in concrete cement.	Do.
15 Inspection shed, Maharajagadai.	1898	1,150	Do. ..	Do. ..	Do.	Square bricks ..	Do.
16 Kitchen attached to rest-house, Maharajagadai.	1898	Included in the main building.	Do. ..	Do. ..	Do.	Mud	Do.
17 Stables and servants' quarters at Maharajagadai.	1898	Do.	Do. ..	Do. ..	Do. ..	Stable mud. Rooms concrete in chunam.	Do.
				Research Range.			
1 Lac godown	1936	1,567	For storing lac produce.	Burnt brick in clay.	Single Mangalore tiles.	Cuddapah slabs ..	Transferred to the control of Provincial Silviculturist, Ootacamund, with effect from 11th September 1942.
2 Lac godown extension ..	1939	664	Do.	Expenditure one side.	Iron sheet	Country panning tiles over 4 inches concrete and cement painted.	Do.
3 Lac factory at Denkanikota	1940	280	For lac factory ..	Bamboo mats and posts.	Cocoanut leaves and bamboo rafters.	Rough stone slabs. ..	Do.
4 Research Range Officer build ings.	1929	4,143	Research Ranger's office and storing lac products.	Burnt bricks in mud.	Mangalore tiles over Honkey's flat tiles.	Square country tiles	Do.

List of departmental wells in North Salem Division.

Serial number and locality. (1)	*Year of construction.* (2)	*Capital value.* (3) RS. A. P.	*Height of parapet.* (4) FT. IN.	*Diameter of well.* (5)	*Nature and depth of lining.* (6)	*Depth of well.* (7)	*Cost of annual repairs.* 1943–44. (8) RS. A. P.	1944–45. (9) RS. A. P.	1945–46. (10) RS. A. P.	*Remarks.* (11)
					Denkanikota East Range.					
1 Range Officer's compound, Denkanikota.	1900	350 0 0	2 6	5 feet	Eight feet chunam plastering.	61 feet	..	..	4 8 0	
2 At Aiyur rest-house ..	1927	540 0 0	3 0	4 feet 6 inches into 3 feet 6 inches	Twelve feet cement plastering.	92 feet	9 1 0	..	4 8 0	
3 Near Gulhatti Inspection shed.	1935	944 9 0	2 6	19 feet	Burnt brick in lime mortar.	63 feet 6 inches	8 12 0	..	4 8 0	
4 At Manchi Inspection shed.	1937	222 0 0	3 0	5 feet 9 inches.	Burnt brick in lime mortar up to 9 feet below the ground-level.	16 feet 10 inches from the ground-level.	..	..	4 8 0	
5 Near Siddapuram Inspection shed.	1937	297 12 0	3 0	6 feet 3 inches.	Burnt brick in lime up to 16 feet below the ground-level.	27 feet 2 inches.	..	..	4 8 0	
6 At Neelamandoddi pen in Kempakarai reserved forest.	1939–40	542 0 0	3 0	7 feet 7 inches.	Random rubble in lime mortar pointed with cement in side stones was done to a depth of 18 feet from 10 feet as the old well exists.	32 feet.	..	..	..	Improvement to grazing ground. A Listern trough was also constructed for storing water.
7 At Elandamaram pen in Tholavubetta reserved forests.	1939–40 and 1940–41	336 9 0	3 0	9 feet 3 inches.	Random rubble in lime mortar pointed with cement inside stones was, done to a depth of 10 feet from ground-level.	29 feet 6 inches from ground level excluding parapet wall.	..	..	..	Improvement to grazing grounds.
					Denkanikota West Range.					
8 Denkanikota village ..	1930–31	333 0 0	3 0	5 feet	Burnt brick in clay 16 feet.	32 feet 3 inches.	..	..	..	
9 At Javalagiri reserved forest (extension area).	1926 1937	250 0 0	..	10 feet top ..	Rough stone revetment.	12 feet to 20 feet as per sketch.	..	..	..	
10 At rest-house, Javalagiri ..	1910	190 0 0	2 6	6 feet 6 inches ×3 feet 9 inches.	8 feet rough stone and mortar.	45 feet ..	3 0 0	..	5 0 0	
11 At Sulakunta attached rest-house.	1941–42	500 6 0	3 0	Inside diameter 7 feet.	Random rubble in lime mortar and pointed with cement to a depth of 11 feet from ground-level.	39 feet ..	4 12 0	5 0 0	..	Newly constructed in 1941–42.
12 At Misenatham village (Devarbetta).	1934	269 0 0	3 0	18 feet ..	Burnt brick in lime.	20 feet, 6 inches.	3 8 0	..	..	

Serial number and locality.	*Year of construction.*	*Capital value.*	*Height of parapet.*	*Diameter of well.*	*Nature and depth of lining.*	*Depth of well.*	*Cost of annual repairs.* 1943–44.	1944–45.	1945–46.	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		RS. A. P.	FT. IN.				RS. A. P.	RS. A. P.	RS. A. P.	
					Denkanikota West Range—cont.					
13 At Sulakunta	Not known.	250 0 0	..	32′ × 32′ 6″/2.	Rough stone revetment.	22 feet ..	..	..	..	Abandoned well.
14 Tamasandiram	1941–42	215 2 0	No parapet wall.	10 feet ..	Do.	20 feet ..	..	..	..	
					Anchetti Range.					
15 At Anchetti village ..	Permitted by the owner of the land.	279 15 0 1 4 0	3 0	6 feet, 3 inches × 4 feet 3 inches	Burnt brick in mortar.	18 feet 6 inches.	..	4 11 0	..	
16 Urigam rest-house compound.	1903 1937–38 value of land.	221 7 0 32 0 0 0 6 0	2 6	5 feet, 11 inches × 4 feet, 3 inches.	8 feet burnt brick in mortar.	38 feet 6 inches.	..	..	1 0 0	
17 Natrapalayam rest-house.	1905	200 0 0	4 0	7 feet, 7 inches.	6 feet burnt brick in mortar.	24 feet 3 inches.	..	..	..	
18 About a furlong from Gerhatti Inspection shed.	Not known.	300 0 0	Not known.	32 feet × 32 feet.	Rough stone dry ..	50 feet ..	..	..	..	
19 Near 19 miles 1 furlong Anchetti-Anaibiddahalla road.	Deepened 1936–38	536 6 0	3 6	7 feet × 5 feet.	Rough stone in lime 6 feet 6 inches.	35 feet ..	1 14 0	3 1 0	32 0 0	Improvement to grazing ground.
20 Near Kalmaduvu pen in Biligundlu reserved forest.	1936–38	386 5 0	2 10	9 feet × 8 feet 3 inches.	Random rubble in lime mortar 5 feet.	30 feet ..	..	..	..	Do.
21 At Natrapalayam rest-house.	1937–38	260 0 0	2 9	6 feet 6 inches × 4 feet, 6 inches upto 10 feet and 6 feet × 4 feet the subsequent depth.	Do.	30 feet ..	2 0 0	..	..	Attached to rest-house, Natrapalayam.
22 At Kundalam pen in Ubrani reserved forest.	1937–38	348 8 0	3 0	5 feet × 5 feet.	Coarsed rubble in lime mortar up to 6 feet.	35 feet ..	..	..	..	Improvement to grazing ground.
23 At Range Officer's quarters at Anchetti.	1937–39	540 12 0	3 10	8 feet, 6 inches × 7 feet, 6 inches.	Coarsed rubble in lime mortar.	5 feet 10 inches at the acquisition as it was silted.	..	..	3 0 0	
24 At Gerhatti Inspection sheds new well.	1939–40	288 8 0	3 3	7 feet inside diameter.	Coarsed rubble in lime mortar.	30 feet 3 inches.	2 12 0	..	3 0 0	Attached to the Inspection shed.
25 Trial shaft at Gollamathi pen.	1939–40	225 10 0	..	..	....	..	..	..	..	No water. Covered with sand. Not in use.
26 Kothinihallidam, in Gollamathi pen.	1941–42	146 6 0*	..	..	..	..	..	..	..	* The dam was constructed as an experimental measure for storing water for animals in grazing grounds and as it was silted and found to be a failure it was abandoned.

27 Stream bed well in Gollamathi pen in Anchetti reserved forest.	1941–42	48 0 0	No parapet wall.	Length 8 feet, breadth 8 feet, height 8 feet, 3 inches.	Dry stone for storing.	..	..	..	..	Improvement to watering facilities in grazing grounds.
28 Stream bed well in 19th mile of Anchetti-Anaibidda road.	1943–44	25 0 0	..	Length 8 feet, 6 inches, breadth 8 feet, 6 inches, height 6 feet, 6 inches.	Rough stone storing and covered with planks 7 feet depth.	..	..	..	..	Do.
29 Stream bed well at 2 miles 5 furlongs of Anchetti-Anaibiddahalla.	1944–45	96 4 0	..	..	Rough stone storing and covered with planks.	..	..	96 4 0	..	For watering facilities.
30 Stream bed well at 2 miles 5 furlongs on the bank of Doddahalla in Taggati reserved forest.	1944–45	90 8 0	..	..	Do.	..	..	90 8 0	..	Do.
Dharmapuri Range.										
31 At Pennagaram Inspection shed.	1913	214 11 0	2 8	5 feet 6 inches.	Burnt brick in mortar.	34 feet 9 inches.	5 0 0	..	5 0 0	Attached to subordinate quarters.
32 At Pennagaram Inspection shed 2 miles 3 furlongs on the Pennagaram-Anaibiddahalla road.	Not known.	125 0 0	No parapet wall.	12 feet × 12 feet.	Rough stone revetment.	10 feet 6 inches.	..	..	..	
33 On the bank of Chinnar (Muthur).	1926	182 5 7	2 7	4 feet 10 inches.	Burnt brick in mortar.	20 feet ..	5 0 0	..	5 0 0	
34 At Range Officer's quarters at Dharmapuri.	1936	183 5 0	3 0	13 feet ..	Burnt brick in lime mortar for 10 feet.	30 feet ..	5 0 0	..	5 0 0	
35 At Kakalnatham pen in Guttirayan reserved forest.	1938	158 0 0	4 6	6 inches 200 ft.	Rough stone 10 feet high.	20 feet ..	..	..	..	
36 At Thoppur Subordinate quarters.	Transferred from Police Department.	200 0 0	3 0	5 feet 3 inches at ground level 3 feet 10 feet at 32nd feet, 4 feet 3 inches at top at parapet wall.	Rough stone in lime mortar.	33 feet ..	5 0 0	..	5 0 0	Transferred from Salem Central division from 1st April 1939.
37 At Mungiparai in Parigam reserved forest.	Existing prior to reservation.	100 0 0	..	30 feet ..	Rough stone revetment 10 feet.	18 feet 9 inches.	..	..	..	Do.
38 Athimaruthukinar in Thoppur reserved forest.	Said to have been sunk by the villagers in Danbarakampatti. Year not known.	200 0 0	No parapet wall.	51 feet × 17 feet.	Rough stone revetment 14 feet 6 inches.	16 feet 6 inches.	..	..	..	Transferred Central from Salem division from 1st April 1939. Improvement to grazing grounds.
39 Aruppupattai kinar, in Perumbalaimalai reserved forest.	1934	210 0 0	..	17 feet × 20 feet	Rough stone revetment 6 feet.	19 feet.	..	..	..	Do.
40 Kottampallam kinar in Perumbalai reserved forest.	Existed prior to reservation.	150 0 0	..	16 feet × 12 feet.	Rough stone dry revetment for 15 feet 6 inches.	19 feet 6 inches.	..	..	..	Do.

Serial number and locality. (1)	Year of construction. (2)	Capital value. (3)	height of parapet. (4)	Diameter of well. (5)	Nature and depth of lining. (6)	Depth of well. (7)	Cost of annual repairs. 1943–44. (8)	1944–45. (9)	1945–46. (10)	Remarks. (11)
		RS. A. P.	IN. FT.				RS. A. P.	RS. A. P.		
Dharmapuri range—cont.										
41 Veppamnatham kinar in Masakal reserved forest.	Existed prior to reservation.	100 0 0	..	9 feet × 7 feet.	Rough stone dry revetment for 6 feet.	15 feet 6 inches.	..	..	..	Transferred from the Central Salem Division from 1st April 1939. Improvement to grazing grounds.
42 Anaichan kinar in Badanavadi reserved forest.	Do.	150 0 0	..	9 feet × 9 feet.	..	12 feet 6 inches.	..	..	..	Do.
43 Goduparai kinar in Badanavadi reserved forest.	Do.	100 0 0	..	9 feet × 9 feet.	..	8 feet ..	..	..	..	Do.
44 Tank in Erijonai in Kesarguli reserved forest.	Deepened in 1937–38.	23 0 0	Parapet wall, east 5 feet, west 3 feet.	Triangular in shape 38 feet on 3 sides.	Rough stone ..	15 feet ..	..	..	..	Watering facilities in grazing grounds.
45 Pennagaram kumri well in Pennagaram.	Deepened in 1941–42.	25 6 10	10 feet.	42 feet × 45 feet with passage 36 feet × 8 feet.	Rough stone work..	15 feet ..	..	..	..	For Kumridars.
46 Munros well in Parigam reserved forest.	Deepened in 1942–43.	428 7 0	7 feet 6 inches with rough stone.	Rectangular in shape 61 feet × 64 feet with passage of 17 feet × 40 feet.	Lining 1 foot thick rough stone.	20 feet ..	..	..	..	For watering facilities in grazing grounds.
47 Ayyamkottai tank in Parigam reserved forest.	Deepend in 1943–44.	278 0 0	7 0	Basin like shape 367 feet in length.	Rough stone 11 feet thick and with earth work 25 feet 6 inches thick.	7 feet ..	28 0 0	98 0 0	489 0 0	Do.
Krishnagiri Range.										
48 At Boganapalli village (Range Officer's quarters) S. No. 770 of Baganapalli village Krishnagiri taluk.	Constructed in 1911.	271 0 0	2 6	5 feet ..	Burnt brick in lime mortar up to 13 feet 6 inches.	48 feet ..	4 4 0	..	4 8 0	Transferred from Vellore West Division from 1st April 1939.
49 Near Meduganpalli rest-house.	The owner of the well has given his consent for its use and upkeep.	317 0 0	2 6	5 feet ..	5 feet	25 feet ..	4 6 0	..	5 4 0	Do.
50 Nagappaneri tank in Maharajagadai reserved forest.	Repaired in 1939–40.	5 0 0	18 feet above water level.	..	Dry rubble masonery 12 feet width and 18 feet above water level.	Not known ..	..	..	40 0 0	Watering facilities in to grazing grounds.
51 Periyaoothu well in Maharajagadai reserved forest.	Do.	150 0 0	..	Square well 23 feet × 22 feet.	1 foot 6 inches long.	Do. ..	..	..	..	Do.
52 Moolai kinar step well in Nandibanda reserved forest.	Repaired in 1942–43.	92 8 0	..	Square well 24 feet × 24 feet.	Rough stone rubble masonery 1 foot 6 inches.	Do. ..	..	..	117 0 0	Do.
53 Nallammokuttai in Maharajagadai reserved forest.	Deepened in 1944–45.	31 12 0	..	..	....	..	..	..	..	Do.

SECTION 4—PAST YIELD.

196. The following statements show particulars of yield and revenue in the division of sandalwood, bamboos, fuel and minor forest produce between 1942–43 and 1947-48.

Statement showing the past yields and the prices realised for the bamboo coupes in North Salem Division during the past six years.

Year.	*Coupe number.*	*Area in acres.*	*Outturn number of bamboos.*	*Revenue.*
(1)	(2)	(3)	(4)	(5)
		DENKANIKOTA EAST RANGE.		
		Aiyur series.		
1942–43	II	2,860	66,477	232
1943–44	III	2,365	91,556	700
1944–45	I	1,687	63,075	3,005
1945–46	II	2,860	43,055	1,135
1946–47	III	2,365	..	1,000
1947–48	I	1,687	..	7,005
		Sameri series.		
1942–43	II	1,462	119,530	285
1943–44	III	1,645	112,051	1,770
1944–45	I	2,411	106,645	4,000
1945–46	II	1,462	73,475	3,999
1946–47	III	1,645	..	1,050
1947–48	I	2,411	..	11,000
		Tholavubetta series.		
1942–43	II	2,409	200,999	2,000
1943–44	III	2,641	85,088	2,705
1944–45	I	3,419	193,869	5,115
1945–46	II	2,049	69,336	3,010
1946–47	III	2,641	..	1,150
1947–48	I	3,419	..	5,206
		Gulhatti series.		
1942–43	II	2,301	155,842	270
1943–44	III	3,932	59,475	1,180
1944–45	I	1,795	133,577	6,005
1945–46	II	2,301	59,796	2,505
1946–47	III	3,932	..	700
1947–48	I	1,795	..	6,000
		Manchi series.		
1942–43	II	2,057	399,470	355
1943–44	III	1,285	267,232	2,650
1944–45	I	1,842	89,297	4,100
1945–46	II	2,057	346,285	1,253
1946–47	III	1,285	..	1,600
1947–48	I	1,842	..	6,000
		Manchi village section series.		
1942–43	II	242	351,040	55
1943–44	III	317	41,849	520
1944–45	I	524	150,966	1,400
1945–46	II	242	8,428	655
1946–47	III	317	..	800
1947–48	I	524	..	810
		Kempakarai series.		
1942–43	II	1,729	212,258	401
1943–44	III	1,673	514,418	1,950
1944–45	I	3,072	69,150	4,100
1945–46	II	1,729	93,378	2,115
1946–47	III	1,673	..	6,000
1947–48	I	3,072	..	7,000
		DHARMAPURI RANGE.		
		Guttirayan series.		
1942–43	II	3,955	104,600	290
1943–44	III	8,052	141,640	1,500
1944–45	I	3,070	557,166	2,565
1945–46	II	3,955	..	No bid.
1946–47	III	8,052	..	5,000
1947–48	I	3,070	..	8,525
		Morappur series.		
1942–43	II	4,644	28,840	212
1943–44	III	2,043	75,515	815
1944–45	I	1,755	27,058	900
1945–46	II	4,644	146,652	1,000
1946–47	III	2,043	..	1,175
1947–48	I	1,755	..	955

Year.	*Coupe number.*	*Area in acres.*	*Outturn number of bamboos.*	*Revenue.*
(1)	(2)	(3)	(4)	(5)
		KRISHNAGIRI RANGE.		
		Panchopalli series.		
1942–43	II	1,683	81,703	250
1943–44	III	2,152	98,694	567
1944–45	I	2,006	71,640	1,000
1945–46	II	1,683	134,118	855
1946–47	III	2,152	..	1,350
1947–48	I	2,006	..	1,055
		Marandahalli series.		
1942–43	II	2,785	61,735	200
1943–44	III	2,316	91,170	425
1944–45	I	3,332	67,650	580
1945–46	II	2,785	105,584	455
1946–47	III	2,316	..	850
1947–48	I	3,332	..	500
		Galigattam series.		
1942–43	II	3,581	110,860	250
1943–44	III	1,913	39,140	455
1944–45	I	706	106,140	1,455
1945–46	II	3,581	62,204	1,055
1946–47	III	1,913	..	650
1947–48	I	706	..	610
		ANCHETTI RANGE.		
		Anchetti series.		
1942–43	II	1,810	419,818	411
1943–44	III	2,720	208,400	2,495
1944–45	I	5,024	331,445	6,000
1945–46	II	1,810	128,315	2,505
1946–47	III	2,720	..	2,950
1947–48	I	5,024	..	1,500*
		Bilikal series.		
1942–43	II	2,352	12,620	40
1943–44	III	1,506	..	75
1944–45	I	2,008	1,700	375
1945–46	II	2,352	17,230	400
1946–47	III	1,506	..	900
1947–48	I	2,008	..	1,050
		Ubrani series.		
1942–43	II	1,770	102,937	343
1943–44	III	2,101	224,000	155
1944–45	I	3,296	..	486
1945–46	II	1,770	52,526	345
1946–47	III	2,101	..	200
1947–48	I	3,296	..	630
		Biligundlu series.		
1942–43	II	8,620	388,000	155
1943–44	III	2,673	91,010	476
1944–45	I	4,646	272,520	2,800
1945–46	II	8,620	180,368	1,205
1946–47	III	2,673	..	478
1947–48	I	4,646	..	5,010
		Natrapalayam series.		
1942–43	II	435	61,548	50
1943–44	III	606	60,220	106
1944–45	I	2,859	..	450
1945–46	II	435	35,612	205
1946–47	III	606	..	425
1947–48	I	2,859	..	855
		Urigam series.		
1942–43	II	2,696	17,255	No bid.
1943–44	III	2,436	..	110
1944–45	I	2,497	..	120
1945–46	II	2,696	41,949	815
1946–47	III	2,436	..	375
1947–48	I	2,497	..	1,500*
		DENKANIKOTA WEST RANGE.		
		Thalli North series.		
1942–43	II	2,100	45,630	135
1943–44	III	3,409	74,834	215
1944–45	I	2,300	44,458	450
1945–46	II	2,100	101,609	265
1946–47	III	3,409	..	170
1947–48	I	2,300	..	240

* Coupes Anchetti and Urigam Number I were sold together during 1947–48 for Rs. 1,500.

Year.	Coupe number.	Area in acres.	Outturn number of bamboos.	Revenue.
(1)	(2)	(3)	(4)	(5)
DENKANIKOTA WEST RANGE—*cont.*				
Thalli South Series.				
1942–43	II	1,528	399,251	115
1943–44	III	1,150	548,877	210
1944–45	I	841	535,667	1,650
1945–46	II	1,528	272,670	1,000
1946–47	III	1,150	..	250
1947–48	I	841	..	430
Javalagiri series.				
1942–43	II	3,493	153,975	215
1943–44	III	865	150,455	895
1944–45	I	3,405	146,889	1,210
1945–46	II	3,493	301,730	895
1946–47	III	865	..	975
1947–48	I	3,405	..	855
Pane West series.				
1942–43	II	4,866	67,454	150
1943–44	III	2,963	407,196	250
1944–45	I	4,039	153,539	1,650
1945–46	II	4,866	47,618	685
1946–47	III	2,963	..	525
1947–48	I	4,039	..	2,100
Pane East series.				
1942–43	II	1,984	101,315	120
1943–44	III	1,530	384,241	120
1944–45	I	2,005	38,661	915
1945–46	II	1,984	36,910	550
1946–47	III	1,530	..	1,100
1947–48	I	2,005	..	1,010
Hulibanda series.				
1942–43	II	2,229	113,150	550
1943–44	III	2,832	78,348	1,925
1944–45	I	2,949	272,326	1,500
1945–46	II	2,229	397,793	1,370
1946–47	III	2,832	..	750
1947–48	I	2,949	..	1,505
Mudukallu series.				
1942–43	II	3,282	101,912	70
1943–44	III	6,214	11,507	205
1944–45	I	2,515	185,265	480
1945–46	II	3,282	34,734	420
1946–47	III	6,214	..	175
1947–48	I	2,515	..	515
Kunhunodi series.				
1942–43	II	7,070	5,019	80
1943–44	III	6,339	750	110
1944–45	I	5,125	21,032	505
1945–46	II	7,070	..	No bid.
1946–47	III	6,339	..	260
1947–48	I	5,125	..	285

Statement showing the past yield and the prices realised for the fuel coupes in North Salem Division during the past years.

Name of felling series.	Year.	Coupe number.	Area in acres.	Outturn fuel and charcoal. Fuel.	Charcoal.	Revenue realized.	Rate per acre.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				TONS. QRS.	TONS. QRS.	RS. A. P.	RS. A. P.
Denkanikota East Range.							
1 Donkanikota ..	1945–46 ..	II	42	90– 0	..	304 8 0	7 4 0
	1946–47 ..	III	35	..	..	420 0 0	12 0 0
	1947–48 ..	IV	40	..	..	320 0 0	8 0 0
Denkanikota West Range.							
2 Sanamavu ..	1940–41 ..	VI	80	75–20	12–62	115 8 0	1 8 0
	1941–42 ..	VII	82	51–30	..	276 12 0	3 6 0
	1942–43 ..	VIII	78	92– 0	3–20	234 0 0	3 0 0
	1943–44 ..	IX	84	104– 0	35–11	341 4 0	4 1 0
	1944–45 ..	X	84	170–60	13–69	1,008 0 0	12 0 0
	1945–46 ..	XI	76	195–20	..	817 0 0	10 12 0
	1946–47 ..	XII	74	..	..	518 0 0	7 0 0
	1947–48 ..	XIII	114	..	..	1,710 0 0	15 0 0

Name of felling series.	Year.	Coupe number.	Area in acres.	Outturn fuel and charcoal. Fuel.	Outturn fuel and charcoal. Charcoal.	Revenue realized.	Rate per acre.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				TONS. QRS.	TONS. QRS.	RS. A. P.	RS. A. P.
			Anchetti Range.				
3 Muthur ..	1942–43 ..	I	105	454–40	139–60	695 10 0	6 10 0
	1943–44 ..	II	105	..	..	No bid.	
	1944–45 ..	II	105	182–40	68– 2	1,785 0 0	17 0 0
	1945–46 ..	III	106	365–40	45–60	1,749 0 0	16 8 0
	1946–47 ..	IV	90	..	..	1,530 0 0	17 0 0
	1947–48 ..	V	116	..	..	2,204 0 0	19 0 0
			Dharmapuri Range.				
4 Cauvery Valley.	1942–43 ..	I	196	417– 0	142–10	5,598 0 0	28 9 0
	1943–44 ..	II	133	618–44	..	3,358 4 0	25 4 0
	1944–45 ..	III	97	543–40	14–40	8,342 0 0	86 0 0
	1945–46 ..	IV	104	647–20	..	5,356 0 0	51 8 0
	1946–47 ..	V I	102 } 16 }	..	..	2,360 0 0	20 0 0
	1947–48 ..	VI	104	..	..	7,800 0 0	75 0 0
5 Bevanurmalai	1942–43 ..	I	104	651–40	95–40	4,686 8 0	45 1 0
	1943–44 ..	II	109	382–20	44–40	2,943 0 0	27 0 0
	1944–45 ..	III	77	25– 0	132–20	6,314 0 0	82 0 0
	1945–46 ..	IV II	76 } 63 }	36– 0	99–60	1,553 0 0 1,287 0 0	20 7 0 17 0 0
	1946–47 ..	V III	74 } 40 }	..	..	1,938 0 0	17 0 0
	1947–48 ..	VI IV	74 } 54 }	..	..	6,400 0 0	50 0 0
6 Perumalai ..	1943–44 ..	I	121	606– 0	..	3,176 0 0	26 4 0
	1944–45 ..	II	102	435– 0	..	9,792 0 0	96 0 0
	1945–46 ..	III	104	485– 0	..	3,796 0 0	36 8 0
	1946–47 ..	IV	93	..	..	2,796 0 0	32 0 0
	1947–48 ..	V III	108 } 28 }	..	..	13,464 0 0	99 0 0
7 Parigam ..	1940–41 ..	V III	117 } 89 }	..	96– 4	463 8 0	2 4 0
		VI	96	332–24	..	432 0 0	4 8 0
	1941–42 ..	VII	92	363–60	..	667 0 0	7 4 0
	1942–43 ..	VIII	100	272–50	..	1,481 4 0	14 13 0
	1943–44 ..	IX	124	265–44	..	1,519 0 0	12 4 0
	1944–45 ..	X	168	275–40	13 0	5,208 0 0	31 0 0
	1945–46 ..	XI	113	312–20	..	2,542 8 0	22 8 0
	1946–47 ..	XII	146	..	..	2,482 0 0	17 0 0
	1947–48 ..	XIII	108	..	..	5,940 0 0	55 0 0
8 Thoppur ..	1940–41 ..	V III	132 } 119 }	80–52 22– 0	..	493 0 0	2 2 0
	1940–41 ..	VI	112	256–40	..	644 0 0	5 12 0
	1941–42 ..	VII	56	221– 0	..	476 0 0	8 8 0
	1942–43 ..	VIII	26	36–40	..	315 4 0	12 2 0
	1943–44 ..	IX	150	149–50	..	2,362 8 0	15 12 0
	1944–45 ..	X	156	143–40	6– 0	3,432 0 0	22 12 0
	1945–46 ..	XI	96	279– 0	..	1,632 0 0	17 0 0
	1946–47 ..	X } XII }	16 106	51– 0 ..	.. ..	272 0 0 5,936 0 0	17 0 0 56 0 0
	1947–48 ..	XIII	82	..	..	4,920 0 0	60 0 0
9 Badamanadi ..	1945–46 ..	III	112	82– 0	..	1,960 0 0	17 8 0
	1946–47 ..	IV	132	..	..	1,244 0 0	17 0 0
	1947–48 ..	V	133	..	..	3,990 0 0	30 0 0
10 Pennagaram ..	1941–42 ..	IV	76	132– 0	..	76 0 0	1 0 0
		I & II	67 & 47	90–40	30–50	135 6 0	1 3 0
	1942–43 ..	V	80	121–38	..	220 0 0	2 12 0
	1943–44 ..	VI	80	140– 0	21–48	640 0 0	8 0 0
	1944–45 ..	VII	79	87–60	32– 0	869 0 0	11 0 0
	1945–46 ..	VIII	84	145– 0	..	1,092 0 0	13 0 0
	1946–47 ..	IX	84	..	..	1,176 0 0	14 0 0
	1947–48 ..	X	82	..	..	656 0 0	8 0 0
			Krishnagiri Range.				
11 Narlakota ..	1940–41 ..	I	552	1687–40	..	2,760 0 0	5 0 0
	1941–42 ..	II	524	1570– 0	41–40	2,620 0 0	5 0 0
	1942–43 ..	III	260	696– 0	..	1,300 0 0	5 0 0
	1943–44 ..	IV	304	670– 0	..	1,884 0 0	6 0 0

Name of felling series.	Year.	Coupe number.	Area in acres.	Outturn fuel and charcoal. Fuel.	Charcoal.	Revenue realized.	Rate per acre.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
						RS. A. P.	RS. A. P.
		Krishnagiri Range—cont.					
12 Hudedurgam	1947–48 ..	I	30	..	..	620 0 0	5 0 0
		III	57				
		IV	37				
13 Maharajagadai, East.	1937–38 ..	I	126	..	..	504 0 0	4 0 0
	1938–39 ..	II	133	Not available.		399 0 0	3 0 0
	1939–40 ..	III	127	12– 0	42–26	285 12 0	2 4 0
	1940–41 ..	IV	150	1,026– 0	28–70	600 0 0	5 0 0
	1941–42 ..	V	135	934–20	30– 0	540 0 0	4 0 0
	1942–43 ..	{ VI	100	26–40	69– 0	556 0 0	5 9 0
		{ III	42	..	34– 0	65 10 0	1 9 0
	1943–44 ..	VII	140	2– 0	212– 0	1,155 0 0	8 4 0
	1944–45 ..	VIII	134	330– 0	24– 0	4,824 0 0	36 0 0
	1945–46 ..	IX	117	484–40	..	4,212 0 0	36 0 0
	1946–47 ..	X	120	..	..	1,920 0 0	16 0 0
	1947–48 ..	XI	144	..	..	2,160 0 0	15 0 0
14 Maharajagadai, West.	1937–38 ..	I	99	..	..	Not available.	
	1938–39 ..	II	113	Not available.		452 0 0	4 0 0
	1939–40 ..	III	123	..	..	No bid.	..
	1941–42 ..	IV	122	4–40	77–24	366 0 0	3 0 0
	1942–43 ..	V	126	12–40	104– 8	322 14 0	2 9 0
	1943–44 ..	VI	136	37– 0	123–40	476 0 0	3 8 0
		III	123	26–40	7–40	492 0 0	4 0 0
	1944–45 ..	VII	112	7– 0	106–40	3,360 0 0	30 0 0
	1945–46 ..	VIII	134	490– 0	5–53	1,742 0 0	13 0 0
	1946–47 ..	IX	115	..	..	2,875 0 0	25 0 0
	1947–48 ..	X	114	..	..	4,560 0 0	40 0 0
15 Narlapalli ..	1938–39 ..	II	63	..	..	472 8 0	7 8 0
	1940–41 ..	III	61	34– 0	77–13	198 4 0	3 4 0
	1941–42 ..	IV	76	45–20	110–40	1,159 0 0	15 4 0
		II	20	13–20	40–20	65 0 0	3 4 0
	1942–43 ..	V	62	44–20	125– 0	682 0 0	11 0 0
	1943–44 ..	VI	60	12–40	74–40	615 0 0	10 4 0
	1944–45 ..	VII	60	30–40	89–60	1,200 0 0	20 0 0
	1945–46 ..	VIII	66	485–62	97–10	3,432 0 0	52 0 0
	1946–47 ..	IX	64	..	..	1,664 0 0	26 0 0
	1947–48 ..	X	65	..	..	2,340 0 0	36 0 0
16 Burgur	1938–39 ..	II	45	Not available.		225 0 0	5 0 0
	1939–40 ..	III	36	11– 0	24–56	117 0 0	3 4 0
	1940–41 ..	IV	35	19–10	39–38	148 12 0	4 4 0
	1941–42 ..	V	38	20–20	27–60	266 0 0	7 0 0
	1942–43 ..	VI	39	27–57	29–20	175 8 0	4 8 0
	1943–44 ..	VII	39	117–40	6–40	341 4 0	8 12 0
	1944–45 ..	VIII	38	15– 0	30–32	760 0 0	20 0 0
	1945–46 ..	IX	40	101–20	13–67	660 0 0	16 8 0
	1946–47 ..	X	39	..	..	312 0 0	8 0 0
	1947–48 ..	XI	40	..	..	1,120 0 0	28 0 0
17 Nandibanda ..	1938–39 ..	II	38	Not available.		142 8 0	3 12 0
	1939–40 ..	III	37	11– 9	73–29	120 4 0	3 4 0
	1940–41 ..	IV	37	4– 0	46–60	129 8 0	3 8 0
	1941–42 ..	V	50	..	37– 2	250 0 0	5 0 0
	1942–43 ..	VI	40	6– 0	27–40	265 0 0	4 10 0
	1943–44 ..	VII	40	12– 0	19– 0	350 0 0	8 12 0
	1944–45 ..	VIII	40	29– 0	34–60	1,080 0 0	27 0 0
	1945–46 ..	IX	40	Lease cancelled.		1,220 0 0	30 8 0
	1946–47 ..	X	35	..	..	525 0 0	15 0 0
	1947–48 ..	XI	34	..	..	850 0 0	28 0 0
		IX	40	..	..	1,600 0 0	40 0 0
18 Kothur	1938–39 ..	I	93	..	..	Sale dropped.	
	1941–42 ..	I	93	0–60	54– 0	465 0 0	5 0 0
	1942–43 ..	II	93	..	..	No bid.	
	1943–44 ..	II	93	24– 0	25– 0	279 0 0	3 0 0
	1944–45 ..	III	75	90–40	3– 0	2,250 0 0	30 0 0
	1945–46 ..	IV	88	56–40	6–61	2,112 0 0	24 0 0
	1946–47 ..	V	82	..	..	1,312 0 0	16 0 0
	1947–48 ..	VI	43	..	..	731 0 0	17 0 0

SECTION 5—PAST REVENUE AND EXPENDITURE.

197. The following statements exhibit the revenue realized and the expenditure incurred in the division during the past ten years :—

Statement showing the revenue obtained from North Salem during the past ten years from 1934–35 to 1943–44.

Year.	By Government Agency.					By consumers or purchasers.				
	Sandalwood.	Timber.	Fuel.	Bamboos.	Other produce.	Timber.	Fuel.	Bamboos.	Grazing.	Other minor forest produce.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1934–35	1,88,536	453	49	8	1,118	..	224	2,556	22,989	1,871
1935–36	2,16,379	727	218	5	1,463	131	340	7,943	19,421	2,683
1936–37	3,87,674	586	36	7	1,905	106	639	6,076	18,192	4,673
1937–38	3,98,307	21	5	..	2,552	19	268	8,527	20,262	3,430
1938–39	3,08,067	101	11	..	4,115	11	248	7,707	14,289	4,133
1939–40	3,10,939	77	5	5	4,935	33	1,955	6,689	24,558	2,330
1940–41	2,77,413	204	931	..	8,164	31	14,555	3,583	24,907	4,858
1941–42	5,98,838	26	96	..	7,339	209	15,544	11,846	24,262	3,634
1942–43	2,35,172	95	521	..	2,910	..	36,690	17,731	24,690	6,042
1943–44	2,51,912	36	88	..	1,141	..	51,158	12,522	27,383	29,293
	31,73,237	2,326	1,960	25	35,642	540	1,21,621	85,180	2,20,953	62,947

Year.	Revenue department.				Drift and waifwood and confiscated forest produce.	Miscellaneous (fires, forfeitures, Forest College, rent of buildings, and other sources).	Total.	Deduct—Refunds by Forest Officers.	Grand total.
	Timber.	Fuel.	Bamboos.	Other minor produce.					
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1934–35	310	805	..	3,840	44	7,828	2,30,631	16	2,30,615
1935–36	766	510	..	6,200	37	4,880	2,61,703	22	2,61,681
1936–37	1,773	806	..	5,153	17	4,687	4,32,330	36	4,32,294
1937–38	959	942	..	6,290	74	5,327	4,46,983	33	4,46,950
1938–39	1,644	1,358	..	4,443	46	7,162	3,53,335	29	3,53,306
1939–40	1,772	1,507	..	7,389	73	9,712	3,71,079	9	3,71,070
1940–41	1,357	1,424	1	8,204	54	8,373	3,32,059	145	3,31,914
1941–42	..	..	..	..	49	8,256	6,70,099	4	6,70,095
1942–43	..	..	..	..	44	8,462	3,32,357	8	3,32,349
1943–44	..	..	..	..	69	10,838	3,84,470	2,068	3,82,402
	8,581	7,352	1	41,519	507	75,525	38,15,046	2,370	38,12,676

Statement showing the revenue realized by the case of Minor Forest Produce in North Salem Division and the yield obtained.

Particulars of minor forest produce.	1942–43. Quantity obtained.	1942–43. Revenue realized.	1943–44. Quantity obtained.	1943–44. Revenue realized.	1944–45. Quantity obtained.	1944–45. Revenue realized.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TONS. QRS. LB.	RS. A. P.	TONS. QRS. LB.	RS. A. P.	TONS. QRS. LB.	RS. A. P.	
Tamarind	57 14 14	2,715 10 0	111 43 18	13,915 0 0	303 15 18	5,681 0 0	
Avaram bark }	23 2 24 }	287 0 0	45 56 12 }	2,070 0 0	15 43 25 }	1,785 0 0	
Nux vomica seeds }	6 3 32 }		0 31 0 }		0 7 0 }		
Konnai bark	29 31 0	279 0 0	Nil.	405 0 0	1 0 0	150 0 0	
20 and 21 kinds of minor forest produce	....	....	....	....	....	....	
Pumgam seeds	3 49 0		1 62 0		0 30 0		
Honey	1 11 24		0 76 12		1 33 21 plus 4 Madras measures.		
Wax	0 70 0		0 33 13		0 50 21		
Puchankottai	3 30 0		10 20 0		0 12 9		
Manjnar	1 76 10	2,400 0 0	0 5 10	12,145 0 0	1 35 0	6,236 0 0	
Soapnut	0 20 8		9 41 0		0 6 7		
Kodukai	2 16 0		8 36 19		0 33 10		
Custard apple	28 cart-load.		0 17 24		13 cart-load and		
Veppam seeds	0 40 0				33 head-load.		
Manure leaves.	693 cart-loads.	262 0 0	415 cart-loads.	145 0 0	13 cart-load and 33 head-loads.	132 0 0	
Statite stone	....	....	Nil.	23 0 0	....	....	
		5,943 10 0		28,703 0 0		13,984 0 0	

Statement showing the expenditure incurred in North Salem Division during the past ten years from **1934–35** *to* **1943–44.**

Year.	By Government Agency. Timber.	Fuel.	Bamboos.	Sandalwood.	Gross and other minor forest produce.	Miscellaneous.	Forest produce removed by private agency.	Removals and replacements of stores, tools and plants.	Works. Roads and bridges.	Buildings.	Other works.	Forest College.	Rates and taxes.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1934–35 ..	4	..	..	26,482	680	..	4,344	77	3,468	1,909	60	44	31
1935–36 ..	262	..	..	30,778	1,949	..	4,366	79	5,428	2,642	103	..	25
1936–37 ..	239	..	..	50,747	2,240	..	4,395	99	4,982	1,771	75	..	26
1937–38 ..	122	..	..	42,861	..	1,143	4,346	302	6,179	3,941	..	..	92
1938–39 ..	..	..	..	49,461	901	..	4,355	310	6,638	3,200	708	..	86
1939–40 ..	10	..	..	34,171	944	..	7,589	237	5,335	2,084	568	..	107
1940–41 ..	71	176	..	25,520	802	..	7,691	117	3,403	1,762	45	..	186
1941–42 ..	..	24	..	29,534	624	..	9,098	80	3,003	2,154	265	..	153
1942–43 ..	99	..	..	31,162	689	..	9,549	152	4,597	1,486	111	..	146
1943–44 ..	326	..	3,604	24,080	676	..	11,599	74	9,550	1,603	64	..	101
Total ..	1,133	200	3,604	3,44,796	9,680	1,143	66,332	1,527	52,633	22,552	1,999	44	953

Year.	Organization improvement and extension of Forests. Regeneration.	Fire protection.	Demarcation.	Other items.	Other charges, Honoraria, supplies and species miscellaneous C.C. 1.	Suspense work advance.	10. C. Establishment. Pay.	Allowances.	Contingencies.	Other charges—Miscellaneous.	A. Capital.	Grand total.
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1934–35 ..	2,127	675	148	..	4,854	..	58,699	8,616	2,988	302	1,063	1,16,746
1935–36 ..	2,259	697	99	..	4,736	..	52,484	9,341	3,276	..	398	1,18,922
1936–37 ..	2,557	717	50	75	6,381	..	53,276	9,690	3,408	..	1,174	1,41,902
1937–38 ..	2,352	678	199	809	8,131	..	32,974	6,879	746	29,481	..	1,41,235
1938–39	587	746	101	472	10,660	..	60,946	10,844	3,125	..	..	1,53,190
1939–40 ..	1,755	684	246	760	9,280	..	73,763	13,575	3,528	..	..	1,54,636
1940–41 ..	740	455	136	374	12,177	..	67,625	10,067	2,771	..	..	1,34,058
1941–42 ..	397	379	205	281	7,328	..	62,908	10,191	3,170	..	..	1,28,794
1942–43 ..	1,764	371	337	184	1,960	113	56,777	13,495	3,205	803	..	1,27,000
1943–44 ..	1,293	444	500	77	222	..	52,397	19,627	3,562	..	..	1,29,799
Total ..	15,831	5,846	2,021	3,032	65,669	..	5,71,849	1,12,325	29,779	30,586	2,635	13,46,282

Remarks :—Figures were taken from the unit register maintained in the District Forest Office.

Statement showing the financial position of the North Salem Division during the past ten years from 1934–35 to 1943–1944.

Year.	*Revenue realized.*	*Expenditure.*	*Profit.*	*Loss.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
	RS.	RS.	RS.		
1934–35	2,30,615	1,16,746	1,13,869		
1935–36	2,61,681	1,18,922	1,42,759		
1936–37	4,32,294	1,41,902	2,90,392		
1937–38	4,46,950	1,41,235	3,05,715		
1938–39	3,53,306	1,53,190	2,00,116		
1939–40	3,71,070	1,54,636	2,16,434		
1940–41	3,31,914	1,34,058	1,97,856		
1941–42	6,70,095	1,28,794	5,41,301		
1942–43	3,32,349	1,27,000	2,05,349		
1943–44	3,82,402	1,29,799	2,52,603		
Total ..	38,12,676	13,46,282	24,66,394		
Average per annum.	3,81,268	1,34,628	2,46,639		

CHAPTER VI—STATISTICS OF GROWTH AND YIELD AND EXPERIMENTS.

SECTION 1—STATISTICS.

198. *Sandalwood—Outturn averages.*—Outturn averages of rough-cleaned sandalwood were computed by from Mr. C. R. Ranganathan from data compiled from the abstracts of extraction furnished in the Control journals. The figures were classified into three-inch girth classes and the averages separately calculated for the various important sandal localities, for each range unit and for the division as a whole. Statements showing the number of trees dealt with in each class, the total outturn of rough-cleaned wood and the average outturn of the girth classes for each locality and range and for the division as a whole will be found at pages 97 to 102 of Mr. Ranganathan's Working Plan.

199. A comparison of the outturn figures for North Salem with the figures for Chengam Range of West Vellore division—Chengam Range shows the highest outturn averages among the ranges dealt with in the Madras Forest Pocket Book, vide page 133 of the Pocket Book shows that while in North Salem the heartwood contents of trees below 14 inches in girth are lower than in Chengam, the production of heartwood in trees above this girth proceeds more rapidly in North Salem than in Chengam. North Salem in fact shows the highest production of the heartwood of all sandal tracts in the Presidency. It is doubtful whether this phenomenon is in any way connected with the fact that North Salem is also the most heavily spiked tract in the Presidency, but it is obvious that the very large quantities of sandalwood which this division has produced in recent years are due both to the heavy incidence of spike and to the relatively large outturn of sandalwood from the trees extracted. For ready reference the outturn averages of North Salem and Chengam for 6 inch girth intervals are presented below in parallel columns :—

Girth in inches.	*Outturn of North Salem in lb.*	*Outturn of Chengam in lb.*	*Percentage of North Salem to Chengam.*
(1)	(2)	(3)	(4)
6	3·5	6·7	47
12	17·0	19·9	80
14	26·0	26·1	100
18	55·0	46·0	120
24	124·0	91·0	135
30	235·0	152·0	155
36	364·0	224·0	163

200. *Bamboos.*—A large number of one-acre plots were laid out in the more important bamboo-bearing reserves of the division, so as to represent the varying densities of stocking and the different types of forest and a detailed enumeration was carried out of the number of

clumps in each plot and the number and nature of the culms found in each clump. The sample plots were mostly of *Dendrocalamus strictus*. The results of the enumeration of each plot as well as an abstract showing the totals and the average contents per acre for each range and for the division as a whole have been given in pages 106 and 107 of Mr. Ranganathan's Working Plan.

201. Girth measurements at breast height were recorded for about a dozen representative culms in each sample plot and the utilizable height of the culms was also estimated. Average girth and height figures have been given in the statements with remarks on the thickness of the walls of the bamboos.

SECTION 2.—EXPERIMENTS.

202. *House-pillars of Hardwickia binata.*—Experiments were carried out by the previous working plans branch in order (i) to test the possibilities of utilizing *Hardwickia* timber as house pillars, (ii) to ascertain the extent of the local demand at Pennagaram, Dharmapuri and adjoining villages, and (iii) to examine the financial aspect of the operations.

An area of about 6 acres of dense *Hardwickia* forest was selected in Wodapatti reserve close to Hogainakal, and trees considered suitable for conversion into house pillars were marked for felling. According to local usage three classes of pillars were differentiated, namely, (i) big pillars 7 feet 6 inches in length and 30 inches and over in basal girth, (ii) medium pillars 7 feet 6 inches in length and 24 to 30 inches in basal girth, and (iii) small pillars 5 feet 3 inches in length and 18 to 24 inches in basal girth. The pillars were made entirely of heartwood, the sapwood being unsuitable as it is readily attacked by white ants.

The average cubical contents of each of the big, medium and small pillars were 2·5, 1·8 and 1 cubic feet respectively. In all, 12 big, 15 medium and 18 small pillars were obtained from the area and in addition 7 pestles each 6 feet long and 12 inches in girth were obtained by conversion of the top end of the trees felled.

The trees were converted at site, the felling and conversion being done by axemen from Matam (a hamlet near Pennagaram). These coolies proved to be experts at the work. The pillars were transported to road-side in head loads and carted to Dharmapuri and Pennagaram in buffalo or bullock-carts.

The total cost of production of the pillars including transport was Rs. 49–6–0 and the total revenue realized by sale of the pillars was Rs. 130–4–0. A trial consignment of 6 pillars of mixed sizes was sent to a timber dealer at Vaniyambadi at a concession rate of Re. 1 per cubit foot with a view to developing an external market for the pillars. All the pillars and pestles with the exception of 4 pillars and 1 pestle were sold and the operations left a net profit of Rs. 80–14–0 or Re. 1–0–6 per cubic foot.

The local demand for pillars is estimated at about 200 per annum. Enquiries made at Vaniyambadi showed that some 500 pillars could be marketed in that market annually if steps were taken to popularize the timber and overcome the prejudice against its use.

203. *Manufacture of charcoal from Hardwickia timber.*—Experiments were made by the working plans branch in order to find out whether charcoal of good qulaity could be made from the wood of *Hardwickia binata* and whether the operation would be remunerative. For this purpose two areas, one of about 3½ acres of sparse *Hardwickia* forest, and the other an acre of dense forest were selected and all *Hardwickia* trees over a minimum girth of 18 inches were felled and billeted.

The charcoal was made in overground paraboloidal kilns. Two expert charcoal burners from Krishnagiri were employed in the work on a daily wage of 8 annas each plus their bus-fare from Krishnagiri to Pennagaram and back. The felling and stacking of the wood were by local coolies, while the construction of the kiln burning and removal of the charcoal were done by the expert burner. The charcoal was loaded into bags and transported to Dharmapuri in buffalo-carts, where about 60 per cent of the total quantity was sold wholesale to a Salem merchant and the balance was sold in retail locally.

The total quantity of stacked billet wood consumed was 1,800 cubic feet or roughly 29·9 tons. The total outturn of charcoal was 203 bags of 70 lb. each or 6·4 tons in all. The percentage outturn of charcoal was 21·4.

The total cost of the operation was Rs. 118–2–0 and the revenue realized was Rs. 151–10–0, thus leaving a net profit of Rs. 33–8–0, which on an area basis works out to a return of Rs. 7–7–0 per acre of forest felled.

The charcoal was sold wholesale at Re. 0–11–6 per bag and in retail Re. 0–13–0 a bag. Details of expenditure incurred in the work are given below :—

	RS.	A.	P.
(1) Cost of production of 6·4 tons of charcoal in 203 bags of 70 lb. each at site, including felling, stacking, burning and loading into bags.	64	11	0
(2) Transport of bags to road-side over a lead of about 200 yards.	2	8	0
(3) Transport to Dharmapuri over a lead of 30 miles including the Pennagaram-Hogainakal ghat.	21	14	0
(4) Freight on return of gunny bags from Salem	4	0	0
(5) Bus charges for two charcoal burners om Krishnagiri to Pennagaram and back twice.	14	0	0
(6) Miscellaneous	1	1	0
Total ..	118	2	0

The charcoal produced was heavy, burnt without smoke, gave a clear ringing sound when struck and possessed a metallic lustre resembling that of coal. Charcoal made out of dead wood appeared to be inferior in quality and spat fire. All users of the charcoal pronounced it to be of excellent quality.

204. Details of experiments for eradication of lantana conducted during the period of Mr. C. R. Ranganathan's Working Plan will be found in paragraphs 189 (*a*) & (*b*) of Chapter V of Part I of this working plan.

PART II.

Future Management discussed and prescribed.

CHAPTER I—BASIS OF PROPOSALS.

Section 1—General Objects of Management.

205. This working plan deals with the whole of the North Salem division as at present constituted. The objects of management vary with each working circle, and they are—

(*a*) Exploitation of forest ;

(*b*) discharge of obligations of the State to the local population ; and

(*c*) conservancy and improvement of the forest.

206. The general principles invloved in these objects may be stated as follows :—

(i) To exploit, with due regard to silvicultural principles, the resources of the forest in sandalwood, bamboo, firewood and minor forest produce ;

(ii) to regulate the supply of firewood and bamboo with particular reference to the requirements of villages and towns in the neighbourhood of the forests ;

(iii) to provide grazing for village cattle and to extend the rotational grazing system initiated according to the last working plan ;

(iv) to maintain the forest in a state of increasing productivity ;

(v) to take steps to produce the maximum financial return per acre of forest through conservancy and artificial regeneration ; and

(vi) to realize the climatological value of forest cover.

Section 2—Methods of Treatment adopted.

207. The details of the methods of treatment to be adopted are discussed and prescribed under the respective working circles. The exploitation will be regulated on area basis in the case of sandal, fuel and bamboo, the annual coupes being so formed as to ensure, as far as possible, sustained yield year after year. Supply of small timber for agricultural needs will be met from fuel coupes. No prescription for extraction of other timber is made in this working plan. Grazing will, as hitherto, be controlled by the issue of permits and will be prohibited in felled fuel coupes for four years (including the year of felling) and, in artificially regenerated areas (Plantations) of teak, softwood, firewood and casuarina, for 6, 10, 7 and 5 years respectively. Minor forest produce will be exploited over the entire division, the area being divided into suitable units for the purpose. Sandal will be continued to be

introduced in suitable selected non-sandal and spike-free areas through propagation centres. Provision will be made to raise teak, softwood and casuarina plantations on an experimental scale in suitable localities. In fuel forests out-side the fuel working circle, suitable areas will be given to kumridars for raising fuel species under 'kumri' method. As a means of eradicating lantana, the lantana-infested areas will be under-planted with bamboo as an experiment on an annual programme.

SECTION 3—WORKING CIRCLES, THEIR AREA AND DISTRIBUTION, AND REASONS FOR THEIR FORMATION.

208. In pursuance of the objects of management set forth above, eleven working circles have been formed in this working plan as follows :—

Serial number.	*Woking Circle's name.*	*Extent in acres.*	*Ranges.*	*Distribution. Reserves or villages included.*	*Number of felling series.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Sandal	278,928	All ranges ..	Aiyur and extensions, Sameri, Nyamasandiram Agraharam, Tholavubetta, Gulhatti, Manchi, Kempakarai, Naganur, Denkanikota and Sanamavu reserved forests: Manchi, Bettamugalalam, Salivaram, Kolhatti Anumanthapuram, Iruthokodai and Santhanamalai villages; Thalli and extension, Javalagiri, Pane and Hulibanda reserved forests and Mallikarjuna Durgam, Palayamkottai, Thavarakerai, Ulimangalam, Karandahalli, Agalakotai, Javalagiri, Achubal, Chudasandiram, Usenatham, Kottanmadagu and Gumalapuram; Madakallu, Anchetti and Taggati villages; Marandahalli and extension, Galigattam, Kesaraguli, Morappur, Guttirayan and Tholavubetta estension reserved forests and Ratnagiri and Vattuvanahalli villages; Anchetti, Natrapalayam Ubrani, Biligundlu, Urigam, Taggati and Bilikal reserved forests; and Natrapalayam, Manchigoundapalli, Urigam, Kottiyur and Taggati villages.	15	For extraction of sandalwood.
2	Bamboo	..	Do. ..	Aiyur and extensions, Sameri, Nyamasandiram Agraharam, Tholavubetta, Gulhatti, Manchi, Kempakarai, Thalli, Javalagiri, Pane, Hulibanda, Marandahalli and extension, Galigattam, Kesaragulli, Morappur, Tholavubetta Extension, Guttirayan Wodapatti (part), Anchetti, Urigam, Taggati, Bilikal, Ubrani, Biligundlu, Hudedurgam, Badanavadi, Bevanurmalai and Thoppur reserved forests, Manchi, Kadakallu, Anchetti, Agalkotai, Karandahalli, Palayamkottai, Mallikarjuna Durgam and Natrapalayam villages.	26	For extraction of bamboo.
3	Fuel	41,400	All ranges, except Denkanikota East.	Sanamavu, Perumbalamalai, Bevanur, Pennagaram, Woddapatti, Badanavadi, Masakal, Guttiroyan, Parigam B, Thoppur, Bargur, Nandibanda, Maharajagadai, Nerlapalli, Kothur and Hudedurgam reserved forests.	17	For extraction of firewood.
4	Firewood Plantation.	750	Dharmapuri ..	Thoppur reserved forest	1	Artificial regeneration of fuel-yielding species by 'kumri.'
5	Casuarina Plantation.	204	Krishnagiri, Denkanikota West.	Hudedurgam, Noganur and Sanamavu reserved forests.	3	Experimental.
6	Teak Plantation.	75	Denkanikota East.	Nyamasandandiram, Agraharam reserved forest.	1	Do.
7	Softwood Plantation.	30	Denkanikota West.	Noganur reserved forest	1	Do.
8	Grazing	451,155	All ranges ..	All the reserved forests in the Division ..	..	For grazing.
9	Minor forest produce.	451,155	All ranges ..	All the reserved forests in the Division ..	18	For collection of minor forest produce.
10	Lac working circle.	..	Denkanikota East.	Gulhatti, Sameri and Tholavubetta reserved forests.	2	For production of lac.
11	Lantana control.	1,125	Denkanikota East and West and Anchetti.	Javalagiri, Gulhatti and Ubrani reserved forests.	3	To under-plant bamboo in lantana-infested areas to eradicate lantana.

SECTION 4—PERIOD OF THE WORKING PLAN.

209. This working plan will be in force for fifteen years from 1950–51 to 1964–65.

CHAPTER II—WORKING PLAN FOR THE SANDAL WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE CIRCLE AND CHARACTER OF VEGETATION.

210. The sandal working circle includes the significant sandal areas occurring in the reserved forests of the division and such sandal bearing blocks of unreserved forests as are extensive enough and rich enough in sandal, requiring extraction. The sandal areas in some of the reserved forests, which had been excluded from the working circle, owing to their smallness or remoteness and for other reasons, in the previous working plan, have still been found to contain only small sized sandal and so, have been excluded from the working circle in the present plan also. Separate provision is made in paragraph 252 for working these excluded sandal areas.

211. Sandal in both reserved forests and unreserves is the absolute property of the state and the conditions prevailing in them are similar. Hence, it is convenient to deal with them under a common working circle. The measures of exploitation prescribed are applicable to both reserved forests and unreserves. As, however, the unreserves are not under the administrative control of the Forest Department, the prescriptions relating to the cultural operations and other improvements will apply primarily to the reserved forests. Such measures may, however, be carried out in suitable unreserves at the discretion of the District Forest Officer. The main sandal block in the division is the Hosur plateau which is mostly included in Dharmapuri and the two Denkanikota ranges. Patches of sandal growth, often of considerable size, continue to occur in Anchetti range, notably in Urigam, Taggati and Anchetti reserved forests. The sandal is invasive in regions in lower elevation, such as the Morappur valley, the Pennagaram, Baiyanurmalai and Woddapatti reserved forests.

212. Mr. C. R. Ranganathan had prepared detailed stock-maps on which he based the constitution of the sandal working circle. The determination of the density of stocking of sandal had been carried out by counting all sandal trees above the height of a man in small units of 5 acres each. Field maps enlarged from the Survey of India sheets (16″=1 mile) had been used in the work and the sandal stock-mapped in the following three density classes :—

25 trees and over per acre	Dense.
10 to 25 trees per acre	Sparse.
Below 10 trees per acre	Scattered.

213. The entire sandal area of the Division had thus been intensively stock-mapped.

214. There being not much change in the sandal area stock-mapped at the time of the previous working plan, no fresh stock maps have now been prepared. However, the areas to which sandal has now spread have been marked in the stock-maps previously prepared and these areas do not pertain to the areas included in the sandal working circle ; they pertain to the " excluded " areas dealt with in paragraph 252.

215. *Area.*—The working circle has a total area of 278,928 acres, of which 97,414 acres represent the effective sandal area, the balance represents the non-sandal area included in the working circle on account of the patchy distribution of the species and the need for adopting natural features as boundaries.

216. *Prevalence of spike disease.*—The spike disease has now spread to almost all series and the mortality of sandal trees due to spike disease has been excessive. The trees of bigger girth classes have almost disappeared except in Manchi, Tholuvabetta and Kempakarai reserves, where big sized trees still exist. No attempt has, therefore, been made to distinguish between healthy and spike-infected areas with a view to prescribe different treatments for them.

217. *Felling series.*—For convenience of working and in order to minimise labour difficulties by distributing the exploitation over several parts of the division, the working circle was divided into 29 felling series in the previous working plan ; a point then kept in view was to so constitute the felling series that one Forester assisted by subordinates could carry out and complete all the operations prescribed in one coupe within the allotted time.

218. It has since been found that, out of the sandalwood trees extracted each year, sapwood trees formed a large percentage. For economical reasons, the extraction of sapwood trees has been stopped from 1st April 1941. It is estimated that, under the circumstances, one Forester assisted by subordinates will be able to tackle a larger area than was

NOTE.—The effective sandal area is 97,414 and not 96,414 acres as noted in paragraph 199 of the last working plan.

allotted in the previous working plan. Hence, the working circle has now been divided into 15, instead of 29 felling series, prescribed in the previous working plan. The reallocation of the felling series would involve reduction in the number of Foresters, who have hitherto been employed on sandal extraction work, consistent with efficiency.

219. The sandal bearing unreserves in each range have been constituted into distinct felling series as, for reasons concerned with legal position in such lands, it was considered undesirable to merge them into joint coupes with reserves.

220. The felling series are more or less compact blocks, except in the case of unreserves, where small extents of sandal forest met with in one village or enclosure and the scattered nature of the villages and enclosures, rendered this arrangement impossible.

221. The following statement gives particulars of the various felling series :—

Serial number and name of felling series. (1)	*Name of reserves or villages.* (2)	*Total area in acres.* (3)	*Effective sandal area in acres.* (4)	*Boundary description.* (5)
	Denkanikota East Range—Reserve Series.			
1 Aiyur	Aiyur, Aiyur Extension I, Aiyur Extension II, Sameri and Nyamasandiram Agraharam.	13,208	8,952	Bit 1. Aiyur reserved forest. Bit 2. Aiyur Extension I reserved forest. Bit 3. Aiyur Extension II reserved forest. Bit 4. Sameri reserved forest. Bit 5. Nyamasandiram Agraharam reserved forest.
2 Gulhatti ..	Gulhatti and Tholavubetta.	16,137	10,259	Bit 1. Gulhatti reserved forest. Bit 2. Tholavubetta reserved forest.
3 Kempakarai ..	Manchi, Kempakarai and Tholavubetta Extension.	11,049	3,398	Bit 1. Manchi reserved forest. Bit 2. Kempakarai reserved forest. Bit 3. Tholavubetta Extension reserved forest.
4 Denkanikota ..	Noganur, Denkanikota, Denkanikota Extension and Sanamavu.	12,121	7,473	Bit 1. Noganur reserved forest. Bit 2. Denkanikota reserved forest. Bit 3. Denkanikota Extension reserved forest. Bit 4. Sanamavu reserved forest.
	Denkanikota East Range—Unreserve Series.			
5 Manchi ..	Manchi, Salivaram and Kolhatti villages.	14,645	2,840	Includes Manchi, Kempakarai, Gulhatti, Tholavubetta, Kodagarai, Alagatta, Sattikal, Erimalai, Kuntikerai, Kottayur, Mukankerai, Galigattam, Kadamakuttai, Pullahalli, Komanur, Thekkumarathupatti, Gudue, Thandanapalli and Chinnakalpalli enclosures and Salivaram and Kolhatti villages.
6 Bettamugalalam.	Bettamugalalam, Iruthukotai, Anumanthapuram (part) and Santhanahalli.	21,587	2,378	Siddapuram and Kachuvadi enclosures Iruthukottai villages. Part of Anumanthapuram village to the north of Onsetti—Thodikuppam foot-path. Whole of Santhanahalli village.
	Denkanikota West Range—Reserve Series.			
7 Javalagiri ..	Javalagiri, Thalli and Thalli Extension.	19,091	17,276	Bit 1. Javalagiri reserved forest. Bit 2. Thalli reserved forest. Bit 3. Thalli Extension reserved forest.
8 Pane	Pane	17,387	9,234	Pane reserved forest.
	Denkanikota West Range—Unreserve Series.			
9 Achubal ..	Achubal, Chudasandiram, Kottamadugu, Unsentham, Gumalapuram, Madakallu, Anchetty and Taggatti (part).	27,590	2,411	Achubal village, Chudasandiram village, Kottamadugu village, Unsenatham village, Gumalapuram village, Belakarai and Rasathpodu enclosures of Thalli and Extension reserved forest, Madakallu village except the portion lying between Hulibanda reserved forest Taggatti village and Mysore Frontier Anchetti village. Limits of Milithiki, hamlet of Taggati village.
10 Kachuvadi ..	Mallikarjuna Durgam, Palamkottai, Thavarakerai, Ulimangalam, Agalakotai, Javalagiri and Karandahalli.	25,160	4,601	Includes the village mentioned in column (3).

Serial number and name of felling series.	*Name of reserves or villages.*	*Total area in acres.*	*Effective sandal area in acres.*	*Boundary description.*
(1)	(2)	(3)	(4)	(5)
		Anchetty Range—Reserve Series.		
11 Anchetty ..	Anchetty, Ubrani and Natrapalayam (part).	25,122	3,588	Bit 1. Anchetty reserved forest. Bit 2. Ubrani reserved forest. North by northern boundary of Natrapalayam reserved forest ; east by eastern boundary of the same reserved forest, upto a point about 40 chains south-west of Madigara-halli ; south, streamlets and ridge 1940, 2496, wests, treamlet to Natra-palayam-Bekuppa foot-path, the foot-path, line to 2,260 ridge to 3,081, 3,070 to starting point.
	Baligundlu (part) ..	..	..	Bit 4. North, stream from the junction of Anchetty-Pennagaram Road and Biligundlu reserved forest bound-ary, Kallumaduvu odai, road, stream-let to Anaibiddahalla the halla and up a streamlet to a point on the Biligundlu boundary, south-east of 1,980 and Bilugundlu northern boundary ; east, the eastern bound-ary of Biligundlu reserved forest, foot-path from Kempakarai to Anai-biddamaduvu, ridge and streamlet to Bepaladamaradu Doddi and Anaibiddahalla and eastern bound-ary of Biligundlu reserved forest ; south, streamlet to 2,430 ridge 2,280, streamlet to Kallamaduvu odai, the odai and streamlet to 2,810 Ontikumman Uddai ; west, ridge 2,810, 2,934 Thaggaibetta 2,760 and western boundary of Biligundlu reserved forest.
12 Urigam ..	Hulibanda, Urigam and Taggatti (part).	20,342	6,905	Bit 1. Hulibanda reserved forest. Bit 2. Urigam reserved forest. Bit 3. North, northern boundary of Taggati reserved forest upto its junction with the foot-path from Taggati to Gundalam ; east by a streamlet to Sigehalla, the halla up to the streamlet running eastwards to Sigehalla near 1,600, Mattur-Haggur Doddai foot-pat upto a streamlet running south ; south ; another streamlet running east from a point on the eastern boundary of Urigam reserved forest ; west, the common boundary of Urigam and reserved forests to the starting point. Bit 4. An area of about 200 acres lying south and west of Doddahalla near Gundalam and south of Gun-dalam-Taggati foot-path.
	Bilikal (part) ..	..	..	Bit 5. North, Biyalapatti-Yedavan-halli foot-path ; east, eastern boundary of Bilikal reserved forest ; south, Biranhalli-Biyalapatti foot-path ; west, Marikerai-Gidde-goundankerai foot-path ; a line north-west to the Kerai, a line to north to a streamlet, then the stream-let to Biyalapatti path and the path to starting point. Bit 6. North and east, eastern boun-dary of Bilikal reserved forest ; south, the streamlet to Bare Betta, ridge 3,500, 3,170 and streamlet north of 2,810, another streamlet, ridge 2,980 and another streamlet to Thoddatti halla ; west, Thoddatti halla and western boundary of Bilikal reserved forest. Bit 7. An area of about 250 acres on either side of Thoddatti halla and to the east of Biyalapatti enclosure line. Bit 8. An area of about 200 acres to the east of Sathanamuttu halla and south of Bilsuli Betta.

Serial number and name of felling series. (1)	Name of reserves or villages. (2)	Total area in acres. (3)	Effective sandal area in acres. (4)	Boundary description. (5)
	Anchetty Range—Unreserve Series.			
13 Natrapalayam.	Natrapalayam, Urigam, Kottayur, Taggatti and Madakallu (part).	24,461	2,694	Includes, Natrapalayam, Urigam, Kottayur and Ubrani enclosures. Taggatti village, Madakallu (part) lying between Bulibanda reserved forest, Taggatti village and Mysore Frontier.
	Dharmapuri Range—Reserve Series.			
14 Guttirayan ..	Kesarguli (part) and Morappur (part).	16,354	6,588	North, northern boundary and eastern boundary of Kesaraguli reserved forest; east, Kargur, Kottayur foot-path, eastern boundary of Kottayur enclosures, eastern boundary of Morappur reserved forest; south, streamlets to 2,780, a line to 2,530, another line to 2,900 ridge 2,800, 3,180, Gundukal, a line and the foot-path from Kottayur to Kolamarti (via) Morappur-Attimotlu streamlets to the western boundary of Morappur reserved forest; west, western boundary of Morappur Kesarguli reserved forests.
	Guttirayan (part) ..	..	..	North, the southern boundary of Kodagarai enclosure upto the trijunction of Tholavubetta Extension, Morappur and Guttirayan reserved forests; east, the eastern boundary of Guttirayan reserved forest; upto a point north of 1,800, streamlets to 3,000 ridge, streamlets from 3,300 and 3,480, ridge 3,480, 3,538, 3,240; south, a line to 2,500 and another line to 2,530; west, ridge to 3,487 Jadamaimalai and to a point about 40 chains north of it, a streamlet running west, up a streamlet through 2,420, a line to 4,380 from the head of the stream, ridge to 4,577 Guttirayan Drug, a line to 4,250 on the western boundary of Guttirayan reserved forest to starting point.
	Krishnagiri Range—Reserve Series.			
15 Marandahalli.	Galligattam, Marandahalli and Marandahalli Extension.	14,474	8,817	Galigattam reserved forest. Marandahalli reserved forest. Marandahalli Extension reserved forest.

222. *Character of vegetation.*—With the exception of a few patches of semi-evergreen forest around Siddapuram, in which sandal is found in profusion, the type of forest associated with sandal is a deciduous thorny scrub, formed of stunted miscellaneous species. The invasion of lantana and the area that this weed has usurped in the division has assumed alarming proportions and it has resulted in a serious dimunition of the low tree incidence per acre, and the sandal is consequently starved of hosts. The lantana itself is a poor and indeed, an undesirable host.

Section 2—Analysis and Valuation of the Crop.

223. As already stated, the stock maps prepared at the time of the preparation of the last working plan have been adopted, marking in them the areas to which sandal has spread since then. Owing to severe spike disease, the enumeration of sandal trees was not considered worthwhile and it has not been undertaken.

224. The last working plan party counted 160,005 dead sandal trees and 74,576 spiked sandal trees of over 3 inches in girth, in the reserves of the Division.

225. The natural regeneration of sandal is profuse and indicates a satisfactory growing stock; but sandal trees of higher girth classes are absent due to the ravages of the " spike " disease. It is probable that the representation of the girth classes in reserves is not dissimilar to that in the unreserves, but the conditions in regard to the incidence of spike are variable in the two classes of lands. The range and intensity of spike are such that the growing stock of sandal is in a continued state of disequilibrum. Inspection of the forests shows that the effect of the ravages of the spike disease has been to reduce to an almost uneconomic figure the average size of the sandal in the forests. In other words, the higher

girth classes of sandal trees are markedly absent and, from year to year, it takes an increasingly large number of trees to make up a ton of scented wood as the average size of the sandal tree extracted is becoming smaller and smaller.

226. The following statement shows the number of sandal trees extracted and the quantity of sandalwood obtained from 1935–36 to 1944–45 in the reserves and unreserves felling series of the Division:—

Year.	*Reserves felling series.*		*Unreserves felling series.*	
	Number of trees extracted.	*Quantity of sandalwood in tons.*	*Number of trees extracted.*	*Quantity of sandalwood in tons.*
1935–36	66,352	329	18,408	84
1936–37	77,721	642	9,915	69
1937–38	76,144	570	17,416	70
1938–39	83,030	649	7,949	132
1939–40	59,647	437	19,019	143
1940–41	60,914	455	10,142	41
1941–42	28,184	269	18,714	165
1942–43	24,881	365	7,445	115
1943–44	15,794	191	3,624	46
1944–45	10,268	132	1,464	34
Total ..	502,935	4,039	114,096	899

227. It is significant that the number of dead sandal trees extracted and the quantity of rough cleaned wood obtained from them, in the Reserve series have steadily been decreasing from 1941–42 onwards.

Section 3—Method of Treatment.

228. The abnormal conditions caused by the spike disease continue to prevail in the division. The exploitation must be confined to the removal of dead trees, either due to spike disease or natural causes, irrespective of any girth class.

229. *Silvicultural system.*—The silvicultural system to be followed is the " Selection System ". It will consist in the removal of dead sandal trees and in the maintenance and improvement of the growing stock through natural reproduction and through sandal propagation centres.

230. *Rotation.*—In a selection crop like sandal, the extraction of which will depend on natural mortality irrespective of size or age, no rotation can be fixed.

231. *Felling cycle.*—Mr. C. R. Ranganathan considered that as the spike disease was very wide spread and in an epidemic form in the division and on account of the heavy mortality caused by the disease and the desirability of extracting the trees soon after they were dead, it was necessary to adopt the shortest possible felling cycle that was consistent with administrative convenience. Hence, a felling cycle of three years was adopted in the previous working plan.

232. As already stated, the number of felling series has now been reduced from 29 to 15. Consequently the area to be gone over each year will correspondingly increase and will be so vast that it will not be consistent with convenient and efficient working, if the felling cycle of three years is adopted. A felling cycle of five years shall, therefore, be adopted.

233. *Division into coupes.*—Each felling series has accordingly, been divided into five coupes, one of which shall be worked in sequence every year. The limits of the coupes have been marked in the maps that accompany this working plan. The boundaries of coupes have, as far as possible, been adopted to follow natural features and the coupes have been formed into compact blocks. As no enumeration of the sandal trees has been made, the coupes have been formed not with reference to the numbers of living trees in them, but with reference to the area. A coupe may, for convenience of working, be divided into several sub-coupes with reference to natural features. The sub-coupes need not be permanent blocks but may be altered according to convenience every time the coupe is worked. Hence, they are not indicated on the maps.

234. *Calculation of the possibility.*—The possibility of the forest cannot be forecasted. It will depend on the number of trees, which may die from year to year. The peculiarly unsettled condition of the sandal growing stock, due to existence of spike disease in an epidemic form, renders the application of statistical laws of doubtful utility in the Division. Against the last working plan estimate of 545 tons of rough cleaned wood during the first cycle and 330 tons of rough cleaned wood in the second and subsequent cycles, the yield obtained was 1,618 tons of rough cleaned wood in the first felling cycle and it varied from 1,880 tons to 1,165 tons of rough cleaned wood in the second and subsequent felling cycles. Therefore, to estimate the possibility will, at best be a guess work. However, for the

purpose of the working plan, it may be estimated that the yield of rough cleaned wood will be about 600 tons for each felling cycle. The reduction in the number of felling series and the increase in the period of felling cycle have been taken into account in arriving at the above estimate. At the end of the second felling cycle, however, all the higher girth class sandal trees in Manchi, Tholavubetta and its extension, Kempakarai and Galigattam reserved forests will have been extracted and the yield is likely to decrease year after year.

Section 4—Method of Executing the Fellings.

235. *Regulation of working.*—One coupe in each felling series shall be exploited completely every year in the sequence indicated in the tabular statement of fellings in paragraph 238.

236. *Agency of fellings.*—All operations connected with the extraction of sandalwood shall be carried out departmentally.

237. *Method of executing the fellings.*—The extraction operations shall be confined only to completely dead trees. All fallen branches and broken stems shall also be removed. Detailed instructions as to the procedure to be adopted in the exploitation of sandalwood are contained in an official pamphlet entitled "*Rules regarding selection, felling, cleaning, classification and disposal of sandalwood and the method of maintaining depot accounts and other registers.*" These rules will be followed subject to the special provisions under this working plan.

Section 5—Tabular Statement of Fellings to be made.

238. The following statement shows the coupes to be worked each year in each felling series :—

Serial number and name of felling series. (1)	*Coupe number.* (2)	*Total area in acres.* (3)	*Effective sandal area in acres.* (4)	*Name of reserve or village.* (5)
		Denkanikota East Range—Reserve Series.		
1 Aiyur	I	3,475	2,326	Aiyur Extension I reserved forest (part).
	II	2,394	1,532	Aiyur reserved forest (part). Aiyur Extension I reserved forest (part).
	III	2,592	1,650	Aiyur reserved forest (part).
	IV	2,353	1,896	Do.
	V	2,394	1,548	Aiyur Extension II, sameri and Nyamasandiram Agraharam reserved forests.
2 Gulhatti	I	3,122	3,097	Gulhatti reserved forest (part).
	II	2,137	2,063	Do.
	III	2,769	2,168	Do.
	IV	4,163	1,581	Tholavubetta reserved forest (part)
	V	3,946	1,350	Do.
3 Kempakarai	I	1,168	514	Tholavubetta Extension reserved forest.
	II	3,470	572	Manchi reserved forest (part).
	III	1,714	539	Do.
	IV	1,914	651	Kempakarai reserved forest (part).
	V	2,783	1,122	Do.
4 Denkanikota	I	1,613	1,519	Noganur reserved forest (part).
	II	1,791	1,514	Do.
	III	1,728	1,488	Denkanikota reserved forest (part).
	IV	5,184	1,370	Do. Denkanikota Extension reserved forest (part). Sanamavu reserved forest (part).
	V	1,805	1,582	Do.
		Denkanikota East Range—Unreserve Series.		
5 Manchi	I	1,496	441	Kempakarai enclosure. Manchi enclosure (part).
	II	8,134	865	Do. Salivaram and Kolhatti villages.
	III	1,736	747	Gulhatti, Tholavubetta and Kodagarai enclosures.
	IV	725	299	Alagatta, Sattikal, Erimalai, Kuntikerai, Kottayur and Mukenkerai enclosures.
	V	2,554	488	Galigattam, Kadamaguttai, Pullahalli, Mamanur, Thekkumarathupalli, Gudur, Thandanapalli and Chinnakapalli enclosures.
6 Bettamugilalam ..	I	1,248	310	Siddapuram enclosure (part).
	II	1,958	543	Do.
	III	860	338	Kachuvadi enclosure.
	IV	1,441	509	Iruthukotai village (part).
	V	16,080	678	Iruthukotai village (part), Anumanthapuram village (part) and Santhanahalli.

Serial number and name of felling series.	*Coupe number.*	*Total area in acres.*	*Effective sandal area in acres.*	*Name of reserve or village.*
(1)	(2)	(3)	(4)	(5)
		Denkanikota West Range—Reserve Series.		
7 Javalagiri	I	3,974	3,552	Thalli reserved forest (part). Thalli Extension reserved forest (part).
	II	3,786	3,589	Thalli reserved forest (part). Thalli Extension reserved forest (part).
	III	3,568	3,391	Thalli reserved forest (part).
	IV	3,142	2,749	Javalagiri reserved forest (part).
	V	4,621	3,995	Do.
8 Pane	I	2,482	1,480	Pane reserved forest (part).
	II	2,410	1,495	Do.
	III	4,075	2,350	Do.
	IV	4,076	2,068	Do.
	V	4,344	1,838	Do.
		Denkanikota West Range—Unreserve Series.		
9 Achubal	I	1,348	906	Achubal village (part).
	II	1,885	487	Do.
	III	10,299	442	Chudasandiram, Kottamadugu, Unsenatham, Gumalapuram villages, Belakarai and Rasathapodu of Thalli reserved forest and Madakallu village (part).
	IV	1,640	201	Madakallu village (part).
	V	12,418	375	Do. Taggati village (part). Anchetty village.
10 Kachuvadi	I	2,611	883	Agalakotai village (part).
	II	1,274	1,099	Karandahalli village (part).
	III	3,859	1,069	Palamkotai village.
	IV	7,890	798	Thavarakerai village. Mallikarjuna Durgam village. Karandahalli village (part).
	V	9,526	752	Ulimangalam village, Javalagiri village. Agalakotai village (part). Karandahalli (part).
		Anchetty Range—Reserve Series.		
11 Anchetty	I	4,012	656	Ubrani reserved forest (part).
	II	3,969	1,189	Do. Anchetty reserved forest (part).
	III	4,353	620	Do.
	IV	7,354	533	Do. Ubrani reserved forest (part).
	V	5,434	590	Biligundlu reserved forest (part). Natrapalayam reserved forest (part).
12 Urigam	I	3,633	1,850	Hulibanda reserved forest (part).
	II	4,377	1,160	Do.
	III	4,351	1,564	Urigam reserved forest (part).
	IV	4,843	1,395	Urigam reserved forest (part) and Taggati reserved forest (part).
	V	3,138	936	Bilikal reserved forest (part).
		Anchetty Range—Unreserve Series.		
13 Natrapalayam ..	I	4,768	821	Natrapalayam enclosure (part).
	II	2,011	499	Do.
	III	2,562	488	Madakallu village (part).
	IV	3,132	336	Do. Kottayur enclosure (part).
	V	11,888	550	Urigam enclosure (part). Ubrani enclosure.
		Dharmapuri Range—Reserve Series.		
14 Guttiroyan	I	2,202	1,147	Guttiroyan reserved forest (part).
	II	2,273	1,145	Morappur reserved forest (part).
	III	2,727	1,031	Kesaraguli reserved forest (part). Morappur reserved forest (part).
	IV	6,796	2,281	Kesaraguli reserved forest (part). Morappur reserved forest (part).
	V	2,356	984	Do. Kesaraguli reserved forest (part).
		Krishnagiri Range—Reserve Series.		
15 Marandahalli ..	I	3,581	2,098	Galigattam reserved forest (part).
	II	2,619	1,390	Do.
	III	3,014	1,693	Marandahalli reserved forest (part). Marandahalli Extension reserved forest (part).
	IV	2,408	2,087	Marandahalli reserved forest (part).
	V	2,852	1,549	Do. Marandahalli Extension reserved forest (part).

SECTION 6—SUBSIDIARY SILVICULTURAL REGULATIONS.

239. The prescriptions under this section apply primarily to reserves. They may be extended to suitable unreserves if the District Forest Officer thinks it desirable to do so.

240. *Tending.*—" Sandal can push its way through all ordinary cover. In North Salem,cases are rare in which the competition of neighbouring crowns is a serious impediment to the development of sandal. In spiked areas, which make up a very large part of the total sandal area money spent on tending is largely thrown away, for, a high proportion of the trees, whose benefit is intended, are destined to an early death from spike. There is also good reason to believe that exposure by tending is an encouragement to the spread of spike. Climbers, generally speaking, are not bad.

241. " Over the huge areas dealt with, unless prohibitive costs be incurred, tending can be no more than somewhat perfunctory operation, which is moreover liable to degenerate into a harmful interference with the vigour of the host trees."

242. " For these reasons, no tending is prescribed, but where in particular localities it is thought desirable, the District Forest Officer, is allowed discretion, limited to Rs. 100 annually, to have tending done " (C.C.P. Mis. No. 492, dated 18th October 1938).

243. Hence, no general tending is prescribed. However, climbers may be cut by subordinates, while enumerating the dead trees for extraction ; but this should involve no expenditure.

244. *Maintenance of optimum host sandal ratio.*—In paragraph 225 to 228 of the last working plan, Mr. C. R. Ranganathan discussed the need for preserving an adequate number of healthy suitable hosts to the sandal growing stock and stated that it was ideally desirable to ensure that the host sandal ratio was on the safe side by preserving a preponderence of host plants as compared with sandal, to introduce artificially host plants capable of resisting spike disease in localities where the ratio is low, to replace gradually host plants that predispose the sandal to spike disease by plants conferring resistance to or immunity from spike disease and to favour the natural regeneration of suitable host plants. He considered that *Cassia siamea* was suitable resistive host in the sandal areas of the North Salem division where lantana has taken possession of the ground and progressively destroyed other species of hosts. He therefore prescribed for the introduction of *Cassia siamea* by sowing seeds in 20 feet diameter circular patches, one chain apart over 50 acres, every year in the coupes for working of in Javalagiri series. Marandahalli series and Gulhatti cast series during the first cycle of three years as an experimental measure and, if at the end of the three years experiment the results were satisfactory and the costs reasonable,the work should be extended to all the sandal felling series on the Hosur Plateau.

245. This operation was carried out from 1935 to 1939 and the aggregate areas and the costs of introducing *Cassia siamea* in the 3 localities were as follows :—

Year.	*Area.*	*Cost.*
	ACS.	RS.
1935	149	558
1936	30	130
1937	9	129
1938	36	183
1939	48	188

246. The results achieved were considered not satisfactory for a variety of causes and so, the work was ordered to be abandoned with effect from 1940–41.

247. The above method of introducing *Cassia siamea* was varied in 1939–40 and, under the varied method, species such as *Schiecehera trijuga Zizyphus jujuba* and Neem were raised with food crops in five feet wide strips, leaving 25 feet vacant belts in between the strips and *Cassia Siamea* was introduced in lines along the edges of each of the strips. This work was carried out in Javalagiri, Gulhatti and Noganur reserved forests in the following years, over the area noted against each.

		ACS.
1939–40	Javalagiri Reserve Forest	18
	Gulhatti Reserve Forest	3
1940–41	Javalagiri Reserve Forest	28
	Gulhatti Reserve Forest	3
1942–43	Noganur Reserve Forest	11
1943–44	Do.	12
1944–45	Do.	24
1945–46	Do.	8

Inspection of the above areas has shown that the result achieved in the above plots has been generally satisfactory, though the 'Kumridars' of the Javalagiri plots have been to some extent indifferent and so this work has been ordered to be discontinued in Javalagiri Reserve Forest. No 'Kumridars' were forthcoming for Gulhatti Reserve Forest from 1942-43. In a scheme prepared by Mr. A. A. Khan in 1943 for artificial regeneration work in North Salem Divisioner. the Kumri method of regeneration has been prescribed for Noganur Aided Forest also. But no kumridar was forthcoming to take up lands in Noganur Reserve Forest for kumri cultivation on the above method from 1946–47.

248. No artificial regeneration of species to serve as resistive hosts to sandal will therefore be prescribed in this Working Plan.

249. *Artificial Regeneration.*—There is no lack of natural regeneration of sandal. It has been recognised that in a division such as North Salem, where the spike disease is spreading rapidly to new areas and persists in an epidemic form, in the invaded areas, artificial regeneration of sandal will be useless. For these reasons, no artificial regeneration of sandal, other than the making of propagation centres in selected non-sandal areas were prescribed in the last working plan, in order to keep the local staff acquinted with the technique of artificial regeneration of sandal. The sandal propagation centres will be continued in this divisi on, but they shall be selected outside the spiked areas and such centres raised under a proper annual estimate.

250. Propagation centres should be made every year in the beats mentioned in the following statements by the forest guard and watcher in charge of the respective beats. The suitable localities in which the propagation centres should be laid out are indicated against each beat. The actual sites for the centres should be selected by the Range Officer. At least five propagation centres shall be made annually in each beat.

Localities suitable for sandal propagation centre.

Beat.	Reserve.	Locality,
	Krishnagiri Range.	
Marandahalli	Marandahalli	Along Gudravallipallam and Bopathem-pallam.
Nerlakota	Nerlakota	Along Vamangondapallam and other stream banks.
	Dharmapuri Range.	
Guttirayan	Guttirayan	Along the banks of the Chinner and along Anailuddahalla.
Pennagaram	Pennagaram	Along the Chinnar bank.
Bevanurmalai ..	Bevanurmalai ..	Along Addavanka.
Masakal	Masakal	Along Gutapallam.
Kalapambodi ..	Kalampodi	Along the banks of Bygampallam.
	Anchetty Range.	
Billigundlu	Biligundlu	Along Kallamaduvu halla and Basavana-maduvu halla.

251. The following prescriptions shall be followed in the creation of the propagation centres :—

(*a*) *Choice of site.*—(i) No propagation centres shall be made in areas of elevation of more than 4,000 feet or in any fuel series constituted in this working plan or in sholas or semi-sholas or in areas which already contain much sandal.

(ii) Stream banks have been selected as suitable localities for propagation centres, because there are chances of the sandal fruits being washed into the stream and spread by water at flood time. It would also be better to lay out the propagation centres in the vicinity of trees yielding fruits which are eaten by birds.

(iii) Propagation centres should be located in areas where some overhead shade is available. Protection from the afternoon sun is an advantage and the centres are therefore, best made in the middle of the clumps of small trees or shrubs, to the east or north-east of standing trees. Open areas and grassy areas should not be selected, and if centres are at all made in such areas, some light overhead shelter must be provided by erecting a pandal over the seed bed.

(*b*) *Size of centres.*—The shape of the centre should ordinarily be square. The length of the side may vary from 10 to 15 feet.

(*c*) *Soil preparation.*—The area proposed for the centre should be completely cleared of all growth. The slash so cut should be allowed to dry and then burnt on the patch the ash being thoroughly raked into the soil. The burning is an essential operation especially in humus soils, where it has the effect of sweetening the soil.

(*d*) *Fencing.*—A stout fence not less than four feet high should be erected round the centre. A stile should be made in the fence for providing access to the seed bed. Care should be taken while constructing the fence that free circulation of air, especially at ground level, is not impeded. The fence should be kept in good repair for a period of six years at least.

(*e*) *Season for sowing.*—Sowing should be done in the middle of May. If, for any reason, the work proves a failure, sowing should be repeated in the middle of September. Each subordinate, who is responsible for the propagation centres, should also sow sandal seed, and seed of suitable hosts, in bamboo baskets. These baskets containing sandal seedlings and its hosts should be planted out to replace casualties at the beginning of the north-east monsoon.

(*f*) *Sowing.*—Shallow saucer-like pits should be made over the patch at two feet intervals. The peripheral 'Saucers' should be at least two feet away from the fence. At least ten selected sandal seeds should be placed in each pit so that the seeds are contiguous. Some straw should then be lightly packed into each 'Saucer' over the seeds and thoroughly wetted. A stick should be placed over the straw to prevent it from being blown away. In order to provide temporary hosts for the young sandal seedlings, the entire areas of the centre, with the exception of the sandal patches, should be sown with seeds of species such as *Dodonea viscosa*, *Cassia tora*, *Cassia siamea*, *Scutia indica* and *Cajanus indicus*.

(*g*) *Watering.*—Unless there is adequate rainfall after the sowings, the seed bed should be watered, at least once a week, till satisfactory germination takes place. After the seeds have germinated, watering is not advisable. It may, however, be done in case of prolonged and unexpected drought.

(*h*) *Tending.*—No weeding or soil working should be done subsequent to germination. The centres should be thinned whenever necessary after the sapplings have established themselves, overhead light should be let into the centres.

(*i*) *General.*—All propagation centres in one locality should be serially numbered. The number of the centre as well as the dates of sowing (and re-sowing, if done) should be marked in tar on an adjacent tree.

SECTION 7—OTHER REGULATIONS.

252. *Exploitation of sandal in areas outside the working circle*—A statement showing the sandal areas excluded from the working circle on grounds of convenience is given below. These areas must be gone over by the respective beat forest guards once in five years and all dead trees extracted :—

Range. (1)	*Reserve.* (2)	*Total area of the reserved forests.* (3)	*Area excluded from the working circle.* (4)	*Remarks.* (5)
		ACS.	ACS.	
Denkanikota East.	Kempakarai ..	6,474	1,777	A patch of the south of the streamlet rising from a point 4,090 and Kodagarai-Kempakarai footpath.
Krishnagiri ..	Hudedurgam ..	8,596	8,596	Sandal growth is young and dead trees are not found.
	Marandahalli and extension.	14,274	6,000	One patch south-east of Mugavemalai. One patch near Komanur 3,730 feet elevation one patch near Komanur enclosure, two patches near 3,500 feet elevation.
Dharmapuri ..	Kesarguli	8,242	4,676	On the banks of Chinnar river and two patches east of Kottayur.
	Morappur	19,314	11,001	Two patches on the banks of Periapallam, another on the bank of Vannathipallam and one patch east of Tankal.
	Pickilimalai ..	5,469	5,469	On the banks of Chinnar.
	Guttirayan ..	14,682	10,207	On the banks of Chinnar and a patch between 1,700 and 1,595 elevation on the banks of Anailiddapalla.
	Pennagaram ..	12,762	12,762	On the banks of Chinnar.
	Bevanurmalai ..	14,020	14,020	Adjoining Kuppanapalle and Akkai Thimmanapalle.

Range.	*Reserve.*	*Total area of the reserved forests.*	*Area excluded from the working circle.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)
Anchetty	Woddapatti ..	18,053	18,053	Adjoining Biligundlu and a patch about three miles from Uthumalai and small patch south of Anchetty Road.
	Taggatti	10,728	7,770	One patch near 1,980, another south of Bilikal-Urigam foot-path, another east of Mukenkere.
	Urigam	7,984	1,739	One patch near 1,980 and another south of Urigam-Bilikal foot-path and another each of Mukankarai.
	Bilikal	13,426	10,297	On the banks of Badakarhalla, one patch on the bank of Cauvery and four patches near Bianapolli-Talajute footpath.
	Kestur	20,824	20,824	Two patches one north and another east of Tippugudai Kallu.
	Mallopalli	9,964	9,964	On the banks of Doddapalli one patch near Anguli, two patches near Udupatti land, one near Bekkuppa.
	Natrapalayam ..	12,323	11,423	On the banks of Doddapolla.
	Biligundlu	15,054	12,326	On the banks of Basanavu-Maduvuholla and Bennathipolla, three patches near Bennathi and one near 2,500 elevation.

253. *Fire protection.*—The fire protection of the sandal working circle is part of the large question of the protection of the whole division. This subject is dealt with in Chapter XIII (Miscellaneous Regulations).

254. *Control.*—The following control forms should be maintained in the District Forest Office.

(*a*) Control Book.
(*b*) Record of works.
(*c*) Felling series journal.
(*d*) Journal for sandal propagation centres.

The forms to be used are given in the Appendix VI.

The year of felling of each coupe and the outturn of rough cleaned sandalwood obtained shall be entered in the maps accompanying this working plan.

Maps showing the exact position of sandal propagation centres made in each locality shall be filed with the propagation centres journal. The serial numbers of the centres shall be marked on the maps.

CHAPTER III—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF VEGETATION.

255. The bamboo type of forest is very wide spread in the division, being co-extensive with the sandal type. With the exception of the Denkanikota and extension, Sanamavu, Hudedurgam and Noganur reserved forests, bamboo is well represented in all the reserve on the Hosur plateau. As is usually the case, neither *Dendrocalamus* nor *Bambusa* descends much below the 2,000 feet contour. The typical bamboo areas in Anchetti range are those in the Urigam and Anchetti reserved forests, while, in Dharmapuri range, among the reserved forests that do not fall on the Hosur plateau, the best growth of bamboo is found in Kesarguli, Morappur and Guttiroyan reserved forests.

256. As with sandal, the optimum conditions for bamboo are found between 2,500 and 3,500 feet above sea-level. This region is also the optimum habitat for lantana. Hence, remarkable alterations of dense bamboo free of lantana and dense lantana, where bamboo regeneration is trying to recover ground lost during flowering, are met with on the Hosur plateau. One is well impressed with the excellence of bamboo that has grown in lantana-area. This position gives rise to the hope that lantana will be kept in check, or even eradicated to a considerable extent, by introducing bamboo in lantana-areas where natural regeneration of bamboo is lacking for any reason. This point is dealt with in Chapter XII.

257. The bamboo working circle includes all areas in reserved forests, where bamboo occurs in workable quantities, and certain blocks of unreserves, where the extent and density of bamboo growth are such as to warrant regular exploitation.

258. The unreserves are under the administrative control of the Revenue Department, but the sale by the District Forest Officer of the bamboo coupes in unreserves, has been agreed to by the Collector of Salem in 1929. In unreserved lands, bamboos may be felled and removed by the local people for their own consumption on permits issued by Revenue Officials. The right of a lessee to exploit bamboos in as unreserve-coupe must, therefore, be qualified by the statutory obligation to let local ryots obtain their domestic or agricultural requirements of bamboo on payment of the prescribed seigniorage fee. These limitations to coupe leases do not exist in the case of bamboo coupes in reserved forests.

259. Due to these fundamental differences in the legal position of the Forest Department in the two classes of lands, it has been found expedient to allot them to two separate sections under the bamboo working circle.

260. In the last working plan, the section comprising the bamboo felling series for reserves was called ' commercial ' section and that for unreserves, the ' village ' section. As a simpler form of nomenclature the former will be called ' the reserve section ' and the latter, ' the unreserve section.'

261. *Character of vegetation.*—Both *Dendrocalamus strictus* and *Bambusa arundinacea* are found. *Dendrocalamus* is by far the more predominant of these two species. *Bambusa* occurs mostly in small blocks on stream banks in Tholavubetta, Aiyur and Sameri reserved forests. It has been stated in the last working plan that *Bambusa* flowered during 1920–24. No flowering of *Bambusa* has occurred since then. *Dendrocalamus* has been flowering sporadically throughout the division and young regeneration at different stages of growth has been noticed. There has been however, no flowering of *Dendrocalamus* for the past three years.

262. *Area.*—The working circle has an area of 212,142 acres. The area of the reserve section is 176,890 acres and that of the unreserve section is 35,252 acres. The latter represents the nominal area of the villages including patta fields brought within the unreserve section of the working circle.

263. *Division into felling series.*—There will be 22 reserve felling series under the reserve section and four felling series under unreserve section. Some non-bamboo area has been included in the reserve felling series on account of natural features having been adopted as boundaries.

264. The reserve felling series have been so constituted wherever practicable, as to make them into compact blocks falling wholly in the concerned ranges and in such a manner that each series will have a separate route of extraction. The District Forest Officer shall fix collection depots and provide extraction paths, for coupes in any of the felling series, if and when there arises friction among the contractors of neighbouring coupes.

265. As far as possible, areas belonging to one village or enclosure have been allotted to one unreserve series, irrespective of their extent, since it is considered essential that there should be a coupe under working every year in the vicinity of the villages concerned.

266. The following statement shows the names, distribution and limits of all the felling series in both the sections :—

I. Reserve Section.

Serial number and name of felling series. (1)	Name of reserve. (2)	Total area in acres. (3)	Effective bamboo area in acres. (4)	Boundary description. (5)	Remarks : (1) lines of export and (2) suggested forest depots. (6)
				Denkanikota East Range.	
1 Aiyur	Aiyur (part) and Aiyur Extension I (part).	6,912	3,002	North by northern boundary of Aiyur Extension I Reserved Forest, east by eastern boundary of Aiyur Extension I Reserved Forest and Aiyur Reserved Forest, south by Mukankere-Aiyur-foot path Thabegulvanka and west by Thabegulvanka.	(1) Kachuvadi-Arcojjur cart-track and its continuation to Aiyur road near eighth mile ; Muneshwarangudi-Aiyur cart-track ; Aiyur-Denkanikota road.
2 Sameri	Aiyur (part), Sameri, Nyamasandiram Agraharam and Aiyur Extensions I (part) and II.	5,518	1,419	North by Thabegulvanka and Aiyur-Mukankere footpath, east by eastern and southern boundaries of Aiyur Reserved Forest, and eastern boundary of Sameri Reserved Forest, south by southern boundary of Sameri Reserved Forest, and west by western boundary of Sameri Reserved Forest, southern and western boundaries of Nyamasadiram Agraharam Reserved Forest and southern, western and northern boundaries of Aiyur Extension Reserved Forest II and western boundaries of Aiyur Reserved Forest, and its extension I.	(1) Smeri-Aiyur loop road and Aiyur-Denkanikota road. (2) Aiyur.
3 Tholavubetta ..	Tholavubetta	8,109	3,950	Tholavubetta Reserved Forest	(1) Kempanhatti-Aiyur cart-track, Aiyur-Denkanikota road, proposed Tholavubetta valley, Anaibidda-Pennagaram road. (2) Iruthokadai, Gaddehalli and Kempakarai.
4 Gulhatti	Gulhatti	8,028	3,787	Gulhatti Reserved Forest	(1) Kempanhatti-Aiyur cart-track, Gulhatti-Aiyur road, Aiyur-Denkanikota and Salivaram-Sivanapalli-Denkanikota cart-track. (2) Gulhatti, Iruthukota and Salivaram.
5 Manchi	Manchi	5,184	3,512	Manchi Reserved Forest	(1) Gulhatti-Aiyur road, Sivanapalli-Kundukota cart-track, proposed extension from Gulhatti to Manchi and from Manchi to fifteenth mile in Anchetti-Pennagaram road, to tap coupe III. (2) Gulhatti, Sivanapalli and Manchi.
6 Kempakarai ..	Kempakarai	6,474	2,318	Kempakarai Reserved Forest	(1) Proposed Tholavubetta valley, Anaibiddahalla cart-track for coupes I to II and Anchetti-Pennagaram road. (2) Kempakarai.
				Denkanikota West Range.	
7 Thalli North ..	Thalli Extension and Thalli (part).	7,809	3,415	North by northern boundary of Thalli Extension Reserved Forest, east by eastern boundaries of Thalli Extension Reserved Forest and Thalli Reserved Forest, south by eastern boundary of Thalli Reserved Forest and Shankava vanka, and west by western boundaries of Thalli Reserved Forest and its extension.	(1) Devarabettam-Gopasandiram road and Thalli-Bangalore road. (2) Gummalalapuram and Devarabettam.
8 Thalli South ..	Thalli (part)	3,519	2,649	North nil, east by Shankava vanka and eastern boundary of Thalli Reserved Forest, south nil and west by western boundary of Thalli Reserved Forest.	(1) Achubal-Thalli cart-track ; Belalu-Thalli cart-track and Thalli-Bangalore road. (2) Achubal and Belalu.
9 Javalagiri	Javalagiri	7,763	2,028	Javalagiri Reserved Forest	(1) Sulakunta-Javalagiri cart-track ; Kempathipalli-Gollahalli cart-track ; Sennamalam-Javalagiri cart-track ; Javalagiri-Thalli road and Thalli-Bangalore road.

Serial number and name of felling series.	Name of reserve.	Total area in acres.	Effective bamboo area in acres.	Boundary description.	Remarks : (1) lines of export and (2) suggested forest depots.
(1)	(2)	(3)	(4)	(5)	(6)
				Denkanikota West Range—cont.	
10 Pane West	Pane (part)	11,868	5,027	North by northern boundary of Pane Reserved Forest, east by Metre vanka ; south and west by southern and western boundaries of Pane Reserved Forest.	(1) Pidivanalam-Andevanahalli cart-track ; Anchetti-Denkanikota road and proposed cart-track from Sulakunta to Anchetti to tap coupe I. (2) Padiganalam, Kundukota and Madakallu.
11 Pane East	Do.	5,519	2,869	North by Metre vanka and northern boundary of Pane Reserved Forest, east by eastern boundary of Pane Reserved Forest, south by southern boundary of Pane Reserved Forest, and west by southern boundary of Pane Reserved Forest and Metre vanka.	(1) Anchetti-Denkanikota road and Sivanapalli-Kundukota-cart-track. (2) Sivanapalli and Kundukota.
12 Hulibanda	Hulibanda	8,010	3,578	Hulibanda Reserved Forest	(1) Proposed road from Sulakunta to Anchetti for coupes I and II, Anchetti-Pennagaram road, Taggati-Anchetti road for coupe I and Javalagiri-Sulakunta cart-track for coupe III. (2) Tagatti, Arunattam, Sulakunta, Hulibanda and Nandimangalam.
				Dharmapuri Range.	
13 Panjapalli	Marandahalli Extension (part).	5,853	3,347	Bit I—North by northern boundary of Marandahalli Extension Reserved Forest ; east by eastern boundary of Marandahalli Extension Reserved Forest ; and Balkal Pallam ; south by southern boundary of Marandahalli Extension Reserved Forest and west by Range boundary. Bit II—Two small patches on either banks of the Chinnar river and along the common boundary of Udaidurgam and Marandahalli Reserved Forests.	(1) Panjapalli-Marandahalli cart-track and Marandahalli-Palakode road. (2) Panjapalli.
14 Marandahalli	Marandahalli and Marandahalli extension (part).	8,433	2,605	North by northern boundary of Marandahalli Reserved Forest and Balkal Pallam ; east by eastern boundary of Marandahalli Extension Reserved Forest, and eastern boundary of Marandahalli Reserved Forest ; south by southern boundary of Marandahalli Reserved Forest ; and west by Range boundary.	(1) Marandahalli-Palakode road. (2) Marandahalli.
15 Galigattam	Galigattam	6,200	2,137	Galigattam Reserved Forest	(1) Kesaraguli-Palakode cart-track proposed road from Bettamugalalam to Belrampatti. (2) Belrampatti.
16 Morappur	Kesaraguli (part), Morappur (part) and Tholavubetta Extension.	10,253	3,077	North and east by eastern boundaries of Thiolavubetta Extension Reserved Forest ; and northern and eastern boundaries of Kesaraguli Reserved Forest ; Nargur-Kottayur foot path ; western boundary of Kesaraguli Reserved Forest ; Tenkal Pallam and a line to Kottayur-Morappur foot path ; south by foot path to Morappur ; Morappur-Kolamarti foot path ; streamlets to western boundary of Morappur Reserved Forest ; west by western boundary of Morappur Reserved Forest ; southern and western boundaries of Tholavubetta Extension Reserved Forest.	(1) Kesaraguli-Palakode cart-track. (2) Berampatti.
17 Guttirayan	Guttirayan and Wodapati (part).	15,283	6,323	Bit I—Whole of Guttirayan Reserved Forest. Bit II—An area of about 425 acres in Muthur Malai of Wodapati Reserved Forest. Bit III—An area of 47 acres on the top of Bevanurmalai in Bevanurmalai Reserved Forest.	(1) Proposed road from Kempakerai to Anaibiddahalla for coupe I. Anaibiddahalla-Pennagaram road for all coupes. (2) Kempakarai, Muthur.

				Bit IV—Three patches of 6,618 and 29 acres in Thachamalai of Badanavadi Reserved Forest. Bit V—Small patch of 16 acres on the top of Jaganathacombai in Thoppur Reserved Forest.	
				Anchetti Range.	
18 Anchetti	Anchetti	9,554	3,250	Anchetti Reserved Forest	(1) Anchetti-Pennagaram road. (2) Gollamothi.
19 Urigam	Urigam (part) and Taggati .	7,629	2,693	North by part of Udupurane-Taggati foot-path; east by eastern boundary of Urigam Reserved Forest; northern boundary of Taggati Reserved Forest; Sige Halla; streamlet running to Sige Halla near 1,600 and footpath from Mathur to Haggur Doddi, south by streamlet north of Haggur Doddi; footpath from Mariammankoil to Kalkuli Doddi (via) 1,800 streamlet from 1,800 rising east of Kup Kal; eastern and southern boundaries of Urigam Reserved Forest; and west by western boundary of Urigam Reserved Forest; footpath from Urigam to Udupurane and eastern boundary of Udupurane enclosure.	(1) Tagatti-Anchetti road. (2) Tagatti.
20 Bilikal	Do.	5,866	2,555	North by Mysore frontier and eastern boundary of Urigam Reserved Forest; east by Tagatti-Udupurane footpath; eastern boundary of Udupurane enclosure; the Udupurane-Urigam footpath; western boundary of Urigam Reserved Forest; and eastern boundary of Bilikal Reserved Forest; south by footpath from Kovehalli to Biyalapatti; a line to the ridge of 2,810 from the junction of the above said footpath with the footpath from Tatakani; thence along the ridge 3,170 to Bare Betta 3,500; a line north to the footpath from Bilikal to Biyalapatti and footpath from Bilikal to Biyalapatti and west by western boundary of Bilikal Reserved Forest.	(1) Proposed road from Urigam to Tagatti to save all the coupes in the series. Unless this road is opened the series cannot be worked. (2) Urigam. (Udupurane enclosure excluded.)
21 Ubrani	Ubrani	7,167	1,406	North by northern boundary of Ubrani Reserved Forest; east by eastern boundary of Ubrani Reserved Forest; south by southern of Ubrani Reserved Forest; and west by western boundary of Ubrani Reserved Forest; and footpath from Gundalam to Anchetti.	(1) The proposed road from Gerhatti to Natrapalayam for coupes II and III and Gerhatti-Pennagaram road. (2) Natrapalayam and Gerhatti.
22 Biligundlu	Biligundlu (part) and Natrapalayam.	15,939	1,961	Bit I—North by northern boundary of Biligundlu Reserved Forest, east by eastern boundary of Biligundlu Reserved Forest; south by Pennagaram-Anchetti road; footpath to Kallumaduvu; Kallumaduvu halla and streamlet from Challappana Betta to Kallumaduvu halla till it meets western boundary of Biligundlu Reserved Forest; and west by western boundary of Biligundlu Reserved Forest. Bit II—North by northern boundary of Natrapalayam Reserved Forest; east by eastern boundary of Natrapalayam Reserved Forest; south by Cauvery river and west by Ganatti halla a streamlet from Konga betta 2,540; thence west along a ridge; thence along streamlet to the footpath from Natrapalayam to Dodda halla, the said footpath and the western boundary of Natrapalayam Reserved Forest.	(1) Anchetti-Pennagaram road for coupes I and II, proposed road from Manchi to Anchetti-Pennagaram road for coupe I and proposed road from Gerhatti to Biligundlu for coupes II and III. (2) Talavadi and Natrapalayam.

II. Unreserved Section.

Serial number and name of felling. Series.	Villages included.	Total area in acres.	Effective Bamboo area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
	Denkanikota East Range.			
1 Manchi	Manchi part	1,083	919	The whole of Manchi enclosure.
	Denkanikota West Range.			
2 Madakallu	Madakallu part and Anchetti.	2,011	1,585	North by Nandimangalam Jagir; east by western and southern boundaries of Pane Reserved Forest; south by northern boundary of Ubrani Reserved Forest; west by the eastern boundary of Hulibanda Reserved Forest.
3 Kachuvadi	Agalakotai, Karandapalli, Palayamkotta and Mallikarjuna-Durgam.	18,534	2,605	The area containing bamboos in the unreserves of the village noted in column (2).
	Anchetti Range.			
4 Natrapalayam ..	Natrapalayam ..	3,624	513	North by northern boundary of Natrapalayam enclosure; east by eastern boundary of Natrapalayam enclosure; south by Kallumaduvu Battigandanur footpath and west by Battigandanur-Gerhatti footpath.

Section 2—Analysis of Crop.

267. The bamboo areas in reserved forests had been stock-mapped in detail at the time when Mr. C. R. Ranganathan's Working Plan was prepared. No new stock-mapping of the bamboo areas has been considered necessary except in the case of the bamboo areas in Hudedurgam, Bevanurmalai, Badanavadi and Thoppur reserved forests, which have been added to the North Salem division from other division with effect from 1st April 1939. The following shows the areas of bamboo felling series under this working plan as compared to those under the last working plan :—

Range.	Felling series.	Areas as per previous working plan.	Area as per present working plan.
	Reserve Section.		
Denkanikota East	1 Aiyur	6,912	6,912
	2 Sameri	5,518	5,518
	3 Tholavubetta	8,109	8,109
	4 Gulhatti	8,028	8,028
	5 Manchi	5,184	5,184
	6 Kempakarai	6,474	6,474
	Unreserve Section.		
	Manchi	1,083	1,083
	Reserve Section.		
Denkanikota West	1 Thalli North	7,809	7,809
	2 Thalli South	3,519	3,519
	3 Javalagiri	7,763	7,763
	4 Pane West	11,868	11,868
	5 Pane East	5,519	5,519
	6 Hulibanda	8,010	8,010
	Unreserve Section.		
	1 Kachuvadi	18,534	18,534
	2 Madakallu	12,011	12,011
	Reserve Section.		
Krishnagiri	1 Panchapalli	5,841	5,853
	2 Marandahalli	8,433	8,433
	3 Galigattam	6,200	6,200
	Reserve Section.		
Dharmapuri	1 Morappur	10,253	10,253
	2 Guttiroyan	15,107	15,283
	Reserve Section.		
Anchetti	1 Anchetti	9,554	9,554
	2 Urigam	7,629	7,629
	3 Billigundlu	15,939	15,939
	4 Bilikal	5,886	5,866
	5 Ubrani	7,167	7,167
	Unreserve Section.		
	Natrapalayam	3,624	3,624

SECTION 3—METHOD OF TREATMENT.

268. *General.*—The factors of importance in any system of regulating bamboo fellings are (*a*) the felling cycle, (*b*) the intensity of fellings in the clump, (*c*) the distribution of fellings in the clump and (*d*) the height at which clumps should be cut. Mr. C. R. Ranganathan has summarised in the last working plan the result of the experiments conducted in the United Provinces and other places on the above aspects in the working of bamboo and the relevant paragraphs from the last working plan are reproduced below :—

"Experiments with *Dendrocalamus strictus*, initiated by Troup and continued by Marsden over a period of eight years in the United Provinces, have shown that annual working of clumps leads to more or less rapid reduction in the size of the clump, in the number of new shoots and in the girth of the clums. The removal of all culms from a clump, except those of the current year, on a cycle of 1, 2 or 3 years resulted in all cases in the deterioration of the clump. Clear-felling all culms including the shoots of the year was found almost (but not quite) to kill the clump. The need for the retention of some old culms, both for the mechanical support of new shoots and for maintaining the rhizome in full vigour, was patent. Marsden found that the height of cutting had no apparent effect on the number of new shoots produced or on the health of the clump, but high cutting produced twigs at the top of the stumps, which impeded working. On the subject of the proper height at which culms should be cut, there is some difference of opinion which is referred to below. The experiment showed that working in the bamboos on a three year cycle, having some old culms as well as all new ones, would probably be the most satisfactory method.

"The observations recorded by W. H. Lovegrove (*Indian Forester*, XXVI, 1900, page 433) on the growth *Dendrocalamus strictus* clumps in the Ganges division of the United Provinces have a bearing on the correct method of exploiting bamboos. He noted that after a needling has established itself, growth takes place from the centre forming thicker and better culms as the plant as a whole gathers strength. As age advances a tendency may be noticed for the clump to advance in certain parts of the periphery of a clump more than in other. If on a slope, the tendency is to advance up that slope, if on the flat, the tendency is controlled by obstructions such as (1) the cutting of all culms on one side of the clump, thereby killing the rhizomes below and thus causing for the time being a more or less impenetrable barrier to the growing rhizomes, (2) rocks, (3) quality of the soil, etc. The conclusions he arrived at were—

(i) That a clump should be encouraged to advance in the directions chosen by itself, which can be told by observation of where the youngest culms are ;

(ii) that bamboos should not be cut over the whole periphery of a clump ; and

(iii) that care should be taken not to clean out too large areas in a clump, if the whole root system is to be kept alive.

"Lovegrove attributed the congestion of bamboos to ill-treatment, such as unrestricted cutting of bamboos round the periphery (resulting in the death of the outer rim of rhizomes and the forcing of the growing culms to turn backwards) and the destruction of young shoots by cattle or man ; these observations were supported by B. A. Rebsch *Indian Forester*, XXXVI, 1910, page 202).

"Lovegrove favoured low cutting of bamboo culms though he admitted that the presence of high green stumps (which according to him died at the rate of one internode a year) kept the root system alive. The theory that bamboo stumps die at the rate of one internode a year has since been disproved, but it seems at least probably that the leaving of high bamboo stumps preserve the rhizomes underneath for a longer period than low cutting does. Rebsch (*ibid.*) took exception to low cutting on the ground that the leaving of high stumps could not possibly cause the death of the outer rhizomes, but would, on the other hand, prolong their vitality and that the congestion of clumps, which was usually attributed to high cutting among other reasons, was more likely to be caused by low than by high cutting. Trotter (*Indian Forester*, XLVIII, 1922, page 597) holds the view that the height of cutting is of no special importance. It will thus be seen that the question is still as open one, and that the best course for us to follow is to adopt a compromise, especially as, whatever might be the silvicultural merits of high cutting, the low cutting of culms is generally more convenient in practice.

"A series of experiments with *Dendrocalamus strictus* in Vellore Division, started under the Bamboo Working Plan prepared by Mr. K. R. Venkataramana Ayyar (Chief Conservator's Proceedings No. 3, dated 22nd January 1920), has yielded interesting results on the question of the best felling cycle for bamboo. Observations were made over a period of eight years and the results have been analysed in the following table, which is based on information supplied by the District Forest Officer, Vellore. These results cannot be considered to be conclusive or reliable.

Method of treatment.	*Experiment number.*	*Felling cycle.*	*Average number of culms produced every year.*	*Total number of culms produced during the cycle.*	*Number of new culms available for felling.*	*Average annual yield per clump in culms.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		YRS.					
100 per cent felling of culms over one year old.	1	2	2	4	2	1	Harmful effect on clumps many died after ten years Culms of poor quality.
50 per cent thinning of culms over one year old on one side of clumps.	2	3	2	6	4	1½	Culms better than in Experiment No. 1 and clump healthier.
50 per cent thinning of culms over one year old evenly over the whole clump.	3	4	1½	6	4½	1½	Clumps died early.
	4	2	2	4	2/21	½	Culms long lived and healthy. Clump not much damaged.
	5	3	4	12	8/24	1½	Clumps healthy.
	6	4	3	12	9/24½	1-1/8	Do.
	7	2	4	8	4/22	1	Clumps not healthy.
	8	3	4	12	8/24	1¾	Clumps healthy.
	9	4	5	20	15/2 7½	1-7/8	Do.

Longevity of Culms.

Cycle.	*Life of culms.* *Maximum.*	*Minimum.*
2 years	12 years	4 years.
3 years	Less than 12 years	4 years.
4 years	Do.	Less than 12 years.

" The Vellore experiments confirm the undesirability of annual working. The three-year felling cycle gave consistently high yields under all the methods of working experimented with and the same outturn was obtained in all cases under this felling cycle. Under the system of felling 50 per cent of old culms and leaving the balance evenly distributed over the clump, the maximum outturn appears to be realised on a four-year cycle. As against this, however, the experiment on the longevity of culms shows that the minimum life of culms under the four-year cycle is less than four years so that a proportion of the culms must be expected to be dead before they are cut, while in the case of shorter cycles, no culms would ordinarily be dead before felling. It seems, therefore, that, all things considered, the three-year cycle would be the most suitable. Experiment in Hoshaiarpur division of the Punjab showed that a three-year cycle gave a higher outturn of mature bamboos of superior classes than a two-year cycle (*Indian Forester*, LVII, 1931, page 499).

" We may conclude this discussion by drawing attention to the obscurity in which the subject of the proper management of bamboos is still wrapped and by quoting Mr. H. G. Champion's summary of the results recorded to date (Silvicultural Research Manual, Volume I, page 98). Whether these conclusions would apply to all localities is not certain.

" (i) Clear-felling is never advisable and at least some of the mature culms, should be kept if only as mechanical support to the young ones.

(ii) Height of cutting is of no special importance, the theory that the stumps die back an internode annually not being correct.

(iii) Short rotation of one and two years cause a fall in the total yield from a clump, except with the lightest forms of felling.

(iv) Mature culms can be cut at any time except when the new culms are growing and so are easily injured.

(v) Established clumps give a higher yield when growing with no overhead cover.

(vi) Moderate cover (e.g., 30 trees about 3 feet in girth per acre) increase the quality of the culms at the expense of quantity.

(vii) Moderate cover is required for regeneration of *Dendrocalamus strictus*.

(viii) Culms grow more closely together in the open than under shade, but no connexion has been traced between interlacing (congestion) and excessive light.

(ix) Interlacing appears to be most probably due to direct injury by elephants, man and insects, rather than to physiological causes ".

" Further exhaustive experiments, scattered over the whole of India on the best methods of working bamboos have been initiated by the Central Silviculturist, and one of the sample plots have been selected in North Salem Division. The results will, however, not be available for a number of years.

269. The experiment initiated by the Central Silviculturist in North Salem Division was conducted in three plots of bamboo area in the Tholuvabetta valley to investigate into the best method of working bamboo for maximum sustained yield in quantity and value by adopting a three-year felling cycle, a four-year felling cycle and a five-year felling cycle. Another experiment that was initiated by the Central Silviculturist in the same locality aimed at studying the life of the individual culm. Both the experiments were started in 1934 but the gregarious flowering of bamboo in the experimental plots in 1944 vitiated the experiments, which had to be closed without arriving at any conclusions. In view of the foregoing observations, there is no alternative except to adopt the same method of treatment as has been followed hitherto. Therefore, the following prescriptions, which are a compromise between the needs of Silviculture so far as are known and consideration of what is possible in practice, are made.

270. *System of management.*—The proposed method of exploitation may be called the selection thinning of bamboo clumps.

271. *Felling cycle.*—A felling cycle of three years is prescribed.

272. *Agency of fellings.*—The fellings shall be made through the agency of contractors under lease system.

273. *Division into coupes.*—Each felling series has been divided into three coupes to be worked every year in the sequence indicated in the tabular statement of fellings (paragraph 287).

274. *Period of contract.*—The practice in the division was to lease bamboo coupes annually for a period of one year. Mr. C. R. Ranganathan expressed the view that in the case of bamboo for which the main market is an external and usually a remote one, annual leases did not give the bamboo coupe contractor sufficient time to organize his exploitation and that a longer lease tenure could result in improved methods of working and increased revenue and considered that a three-year lease was an important step towards attracting capital to the bamboo business and at the same time allow of a strict observance of the bamboo felling rules from the view point of increased control over the felling operations which would result in silvicultural advantage. He, however, stated that notwithstanding the several economical and silvicultural advantages that were expected to result from the adoption of three-year leases, it might be necessary for administrative reasons to adhere to one-year lease period for certain series, if not for all series and that, therefore, it was not prescribed that three-year lease should be adopted for all or any series. He strongly recommended that in all cases where administrative considerations did not preclude it, the lease period should be three years. In other words, the last working plan gave a discretion to the District Forest Officer in fixing the lease period.

275. In accordance with the above suggestion, three coupes in each of the eleven bamboo felling series in Denkanikota East and West ranges were sold in 1938 on a three-year lease system, with the result that the sale amounts fetched at the sale were not only not advantageous but were definitely less than what the concerned coupes fetched previously when they were sold on a one-year lease.

276. As a compromise between the shortest lease period of one year and the longest lease period of three years, it was thought expedient to sell two coupes in each of ten bamboo felling series in Denkanikota East and West, in 1939, on a two-year lease period. Even at this sale, the sale amounts fetched for the concerned coupes were less than what they fetched at the previous sale with one-year voidha.

277. It has, therefore, been considered that the changeover of the lease period from one year to three or even two years has not given desirable results and, from 1941–42 onwards, the one-year lease period has been reverted to.

278. It is therefore prescribed that the period of contract for bamboo coupes shall be one year, from 1st April to 31st March, in future.

279. *Yield.*—The following statement shows the outturn of bamboos obtained from coupes of all the bamboo felling series of the division from 1935-36 to 1944–45 :—

Year.	"*Commercial*" *section.*	"*Village*" *section.*	*Total.*
1935–36	1,685,713	65,206	1,750,919
1936–37	1,623,686	69,420	1,693,106
1937–38	2,084,535	117,271	2,201,806
1938–39	1,920,994	500,317	2,421,311
1939–40	1,668,751	49,078	1,717,829
1940–41	1,951,699	129,817	2,081,516
1941–42	2,958,192	163,523	3,121,715
1942–43	3,076,046	519,519	3,595,565
1943–44	2,286,315	114,326	2,400,641
1944–45	3,294,247	380,163	3,674,410
Total ..	22,550,178	2,108,640	24,658,818

Based on the above figures, it may be estimated that the reserve sections will yield 2,200,000 culms and the unreserve sections 200,000 culms per year on an average.

SECTION 4—METHOD OF EXECUTING THE FELLINGS.

280. *Regulations of the working.*—The felling will be regulated entirely by area, one coupe being felled during one financial year in the order shown in the tabular statement of fellings (paragraph 287).

281. The lease of bamboo coupes in the unreserve section shall be subject to the statutory right of the local villagers to obtain their requirements for bona fide domestic and agricultural purposes at seigniorage rates. It must, therefore, be provided in the lease agreements for the unreserve bamboo coupes that the lessee shall be bound to supply bamboos on demand by the local villages at the seigniorage rates, laid down in the ***Forest Manual***, ex-depot.

282. If in any year, bamboo coupes in unreserve section are not leased to contractors for any reason, removal of bamboo by the local villagers for their bona fide domestic and agricultural purposes shall be permitted on permits issued by the Range Officers concerned from any part of the unreserve series.

283. *Felling Rules.*—The following rules will apply to both reserve and unreserve sections, whether the removals are effected through the agency of contractors or on permits issued departmentally or by other agency. In these rules, the expression "mature culms" means culms more than one year old and "new culms" means less than one year old—

(i) No new culm shall be felled.

(ii) At least six mature culms shall be left in each clump. Any clump having only six or less culms shall not be felled.

(iii) The felling shall be made only on the side opposite to that in which larger number of new culms are found.

(iv) No culm shall be cut below one foot from the ground and cutting culms at more than two feet from the ground should not be permitted.

(v) The contractor or his authorised agent must attend personally, even in the most remote parts of the coupe, to the supervision of bamboo fellings. The District Forest Officer and the Range Officer should enforce the bamboo felling rules strictly.

284. *Controlled Working of Specially Selected Bamboo Felling Series.*—As it was realised that the enforcement of the bamboo felling rules be attended with difficulties, that in actual practice the fellings would fall short in varying degrees of the standard set in the above rules, that the main obstacle in the strict enforcement of the felling rules was the difficulty of supervising the bamboo fellings scattered over vast areas and so counteracting the responsibility of contractors and the ignorance and or neglect of felling coolies and that the education of the felling coolies in the correct methods of felling and close control of work would gradually lead to the general adoption of such methods as a matter of course, it was prescribed in the last working plan to strictly enforce the bamboo felling rules in a few blocks of good and easily accessible bamboo forest, experimentally.

285. This experiment involved the division of each bamboo coupe into not less than two and not more than four strips of more or less equal area, so as to facilitate control and ensure distribution of felling over the whole coupe and confining the fellings at any one time to one strip only, regulating the period of fellings to three, four or six months according as there are four, three or two strips in the coupe.

286. The bamboo coupes in Sameri and Thalli South Felling Series were leased for working in 1938–39 under the above special conditions. It was found at the end of the year that the contractors were not able to strictly adhere to the felling rules and so they were fined for breach of the rules. No bidders came forward at the sale of the subsequent coupe of the Sameri Felling Series in 1939–40; as they considered that the felling rules were too rigid to allow them a fair margin of profit. Hence no more coupes were worked under the special conditions.

For the above reasons no special working is suggested in this working plan.

SECTION 5—TABULAR STATEMENT OF FELLINGS TO BE MADE.

287. The following statement shows the areas and boundaries of the coupes in each felling series :—

Serial number and name of felling series.	*Name of reserve.*	*Coupe number.*	*Total area in acres.*	*Effective bamboo area in acres.*	*Boundary description.*
(1)	(2)	(3)	(4)	(5)	(6)
					Denkanikota East Range.
1 Aiyur ..	Aiyur and Aiyur Extension I (parts).	I	1,687	910	North by Dodur Vanka, the ridge to 4235, a streamlet running north-east from 4235; east by eastern boundary of Aiyur reserved forest; south by Mukankere-Aiyur foot-path and Thabgul Vanka; and west by a streamlet from Thabgul Vanka to 3610, ridge 3820, 3817, 3798 and streamlet to Aiyur Extension I reserved forest southern boundary, the said boundary and the eastern boundary of Kachuvadi enclosure.
	Do.	II	2,860	1,106	North by northern boundary of Aiyur Extension reserved forest; east by eastern boundaries of Aiyur extension and Aiyur reserved forest; south by a streamlet to 4235 down the ridge to fire line, and Dodur Vankâ; and west by eastern, northern and western boundaries of Kachuvadi enclosure and Dodur vanka and Thabgul Vanka.
	Do.	III	2,365	986	North by Dodur Vanka, western and southern boundaries of Kachuvadi enclosure and southern boundary of Aiyur Extension I reserved forest; east up a streamlet to 3798, ridge 3817, Sannasi Gundu, 3820, 2610; south by a streamlet from 3610 running south-south-west to Thabgul Vanka (joining near 3170), Thabgul Vanka Mukankere-Aiyur foot-path, Thabgul Vanka; and west by Thabgul Vanka.
2 Sameri ..	Aiyur (part), Nyamasandiram Agraharam, Aiyur Extension II and Aiyur Extension I (part).	I	2,411	399	*Bit I*—North nil; east by Thabgul Vanka, a streamlet running north from 3680, ridge 3680, 3830 Jathari Guttai to the southern boundary of Aiyur reserved forest; south by southern boundary of Aiyur reserved forest; and west by western boundary of Aiyur reserved forest and its Extension I. *Bit II*—The whole of Nyamasandiram Agraharam reserved forest. *Bit III*—The whole of Aiyur Extension II.
	Aiyur (part).	II	1,462	516	North by Thabgul Vanka and Aiyur-Mukankere foot-path; east by eastern boundary of Aiyur reserved forest; south by southern boundary of Aiyur reserved forest; and west by ridge 3830, Jathari Guttai 3630, streamlet to Thabgul Vanka.
	Sameri ..	III	1,645	504	The whole of Sameri reserved forest.
3 Tholavubetta.	Tholavubetta (part).	I	3,419	1,472	North by southern boundary of Tholavubetta enclosure, a streamlet running south and then east from within the enclosure east of Tholavubetta-Manchi foot-path, Tumbe Halla, Jalamarikal Halla and eastern boundary of Tholavubetta reserved forest; east by eastern of Tholavubetta reserved forest; south by southern boundary of Tholavubetta reserved forest; and west by Hebba Halla and Samesar Halla.
	Do.	II	2,049	1,132	North by streamlet from the common boundary between Tholavubetta and Gulhatti reserved forests up to 3969; east by ridge 3969, Gubikal up to western corner of Tholavubetta enclosure, western boundary of Tholavubetta enclosure; Samesar Halla and Hebba Halla; south by southern boundary of Tholavubetta reserved forest; and west by western boundary of Tholavubetta reserved forest.
	Do.	III	2,641	1,346	North by northern boundary of Tholavubetta reserved forest; east by eastern boundary of Tholavubetta reserved forest; south by Jalamarikal Halla, Tumbe Halla and up to the streamlet to Tholavubetta enclosure southern boundary and the said boundary; and west by the western boundary of Tholavubetta enclosure, ridge 3969 and stream to common boundary between Tholavubetta and Gulhatti reserves and the western boundary of Tholavubetta reserved forest (Tholavubetta enclosure excluded).

Serial number and name of felling series. (1)	Name of reserve. (2)	Coupe number. (3)	Total area in acres. (4)	Effective bamboo area in acres. (5)	Boundary description. (6)
					Denkanikota East Range—cont.
4 Gulhatti ..	Gulhatti (part).	I	1,795	1,061	North by fire line from 2790, Madegamedu Pallam, southern and eastern boundaries of Gulhatti enclosure and Gulhatti-Siddapuram foot-path; east by eastern boundary of Gulhatti reserved forest; south nil; and west by western boundary of Gulhatti reserved forest.
	Do.	II	2,301	1,284	North by Srisandiram-Gulhatti foot-path; east by western and southern boundaries of Gulhatti enclosure; south by Madegamedu Pallam and fire line through 2790 to western boundary of Gulhatti reserved forest; and west by western boundary of Gulhatti reserved forest.
	Do.	III	3,932	1,442	North by northern boundary of Gulhatti reserved forest; east by eastern boundary of Gulhatti reserved forest; south by Siddapuram-Gulhatti foot-path, eastern-northern and western boundaries of Gulhatti enclosure and Gulhatti-Srisandiram foot-path; and west by western boundary of Gulhatti reserved forest.
5 Manchi ..	Manchi (part).	I	1,842	1,176	North, nil; east by Sivanapalli-Manchi foot-path; south by streamlet running west above 2780, Hebba Halla, and western boundary of Manchi reserved forest; and west by western boundary of Manchi reserved forest.
	Do.	II	2,057	1,197	North by Hebba Halla, streamlet to north of 2780 to Sivanapalli-Manchi foot-path, the said foot-path and streamlets to 3436 on the eastern boundary of Manchi reserved forest; east by eastern boundary of Manchi reserved forest; south by southern boundary of Manchi reserved forest; and west by western boundary of Manchi reserved forest.
	Do.	III	1,285	1,139	North and east by eastern boundary of Manchi reserved forest; south by streamlet from 3436 to Manchi-Sivanapalli foot-path and west by Manchi-Sivanapalli foot-path.
6 Kempakarai.	Kempakarai (part).	I	3,072	851	North by northern boundary of Kempakarai reserved forest; east by eastern boundary of Kempakarai reserved forest foot-path; south by eastern and northern boundaries of Kempakarai enclosure, Hebba Halla streamlet to south-eastern corner of Manchi enclosure, point 3480; and west by western boundary of Kempakarai reserved forest.
	Do.	II	1,729	746	North by southern boundary of Manchi enclosure and streamlet from south-east corner of Manchi enclosure 3480 to Hebba Halla; east by Hebba Halla, northern and western boundaries of Kempakarai enclosure; south by Hebba Halla and southern boundary of Kempakarai reserved forest; and west by western boundary of Kempakarai reserved forest.
	Do.	III	1,673	721	North, nil; east by eastern boundary of Kempakarai reserved forest; south by southern boundary of Kempakarai reserved forest; and west by Hebba Halla southern and eastern boundaries of Kempakarai enclosure and Kempakarai-Kodagerai foot-path.
					Denkanikota West Range.
7 Thalli, North.	Thalli and Thalli Extension (parts).	I	2,300	1,188	North by Belakerai Vanka and northern boundary of Thalli Extension reserved forest; east by eastern boundaries of Thalli Extension and Thalli reserved forest; south by a streamlet running north-west to Belakerai Vanka rising from a point on Thalli reserved forest; eastern boundary about 10 chains north of 3206 and west by northern boundary of Thalli reserved forest.
	Do.	II	2,100	1,169	North by northern boundary of Thalli Extension reserved forest; east, nil; south by Belakerai Vanka and southern boundary of Thalli Extension reserved forest; and west by western boundary of Thalli Extension reserved forest.
	Thalli (part).	III	3,400	1,058	North by northern boundary of Thalli reserved forest; streamlet to eastern boundary of Thalli reserved forest to a point north of 3206; east and south by eastern boundary of Thalli reserved forest; and west by Shankara Vanka and the Mysore Frontier.

Serial number and name of felling series.	*Name of reserve.*	*Coupe number.*	*Total area in acres.*	*Effective bamboo area in acres.*	*Boundary description.*
(1)	(2)	(3)	(4)	(5)	(6)
					Denkanikota West Range—cont.
8 Thalli, South.	Thalli (part).	I	841	753	North by streamlet from Mysore Frontier to a point south of Anjaneyankoil on the Marasandiram-Mysore Frontier foot-path, and the foot-path ; east by eastern boundary of Thalli reserved forest ; south by Achabal-Mysore Frontier foot-path to a point 10 chains south of 2910 ; and west by Mysore Frontier.
	Do.	II	1,528	1,025	North, nil ; east by Shankara Vanka ; south by eastern boundary of Thalli reserved forest ; Marasandiram-Mysore Frontier foot-path (via) Anjaneyankoil and a streamlet running west to Mysore Frontier and west by Mysore Frontier.
	Javalagiri (part).	III	1,150	871	North by the foot-path from south of 2910 on the Mysore Frontier to Achabal ; east by eastern boundary of Thalli reserved forest ; south, nil ; and west by Mysore Frontier.
9 Javalagiri ..	Javalagiri (part).	I	3,405	512	North by Sennamalam-Javalagiri foot-path and northern boundary of Javalagiri reserved forest ; east by eastern boundary of Javalagiri reserve forest ; south by southern boundary of Javalagiri reserved forest ; and west by southern boundary of Javalagiri reserved forest, a line from a point on the reserved forest boundary due north of 3150 to a streamlet running to Bantigaundemkere Halla, the streamlet to the starting point on the northern boundary.
	Do.	II	3,493	765	North by northern boundary of Javalagiri reserved forest ; east by Javalagiri-Sennamalam foot-path, streamlet and a short line to a point on the Javalagiri reserved forest, line north of 3150 and southern boundary of Javalagiri reserved forest ; south, nil ; and west by western boundary of Javalagiri reserved forest and the ridge due north to 2840, 3336 to the starting point on the northern boundary.
	Do.	III	865	751	North by northern boundary of Javalagiri reserved forest ; east by ridge 3336, 2840 ; south and west by Javalagiri reserved forest line.
10 Pane, West.	Pane (part).	I	4,039	1,622	North by northern boundary of Pane reserved forest ; east by a streamlet starting from the junction of the foot-path from Padiganalam to Pane with northern boundary of Pane reserved forest, Akkathangikove and Gundumadu Halla ; south and west by southern and western boundaries of Pane reserved forest.
	Do.	II	4,866	1,871	North by northern boundary of Pane reserved forest ; east by northern boundary of Pane reserved forest and streamlet, east of Chinna Arisin Kallu ; south by streamlets, east and west from Bare Kallu 3270 and southern boundary of Pane reserved forest ; and west by Gundumadu Halla, Akkathangikove and a streamlet rising on the northern boundary of Pane reserved forest, south-east of Padiganalam.
	Do.	III	2,963	1,494	North by northern boundary of Pane reserved forest ; east by northern boundary of Pane reserved forest and Metre Vanka ; south by southern boundary of Pane reserved forest ; and west by southern boundary of Pane reserved forest up to its junction with the streamlet rising at Bare Kallu and streamlets to and from Bare Kallu ridge to another streamlet east of Chinna Arisin Kallu and the streamlet to the starting point on the northern boundary.
11 Pane, East.	Pane (part).	I	2,005	809	North, nil ; east by Sayanguttan Vanka and the Allam-Anchetti foot-path ; south by southern boundary of Pane reserved forest ; and west by southern boundary of Pane reserved forest and Metre Vanka.
	Do.	II	1,984	1,202	North by part of Matre Vanka and northern boundary of Pane reserved forest ; east by eastern boundary of Pane reserved forest ; south and west by streamlet to Metimaduvu Halla and Sayanguttan Halla.
	Do.	III	1,530	1,195	North, nil ; east by Sayanguttan Vanka, streamlet running south to Metimaduvu Halla and eastern boundary of Pane reserved forest ; south by southern boundary of Pane and west by foot-path from Anchetti to Allalam.

Serial number and name of felling series.	*Name of reserve.*	*Coupe number.*	*Total area in acres.*	*Effective bamboo area in acres.*	*Boundary description.*
(1)	(2)	(3)	(4)	(5)	(6)
					***Denkanikota West Range*—cont.**
12 Hulibanda.	Hulibanda (part).	I	2,940	1,195	North by Bavihalla and the streamlet rising from the saddle between Adoraibanda 3080 and 3110 and running into Ichimaduvuballa, and eastern boundary of Hulibanda reserved forest; east, south and west by eastern, southern and western boundaries of Hulibanda reserved forest.
	Do.	II	2,229	1,008	North and east by eastern boundary of Hulibanda reserved forest; south by the streamlet from Ichimaduvuhalla to the saddle between 3110 and 3080 Adoraibanda, and Bavihalla; and west by western boundary of Hulibanda reserved forest, streamlet from Sike Guddai, Ichimaduvuhalla and up the streamlet from east of Sulakunta to the starting point on the eastern boundary of Hulibanda reserved forest.
	Do.	III	2,832	1,375	North by northern boundary of Hulibanda reserved forest; east by eastern boundary of Hulibanda reserved forest and the stream from east of Sulkunta to Ichimaduvuhalla; south by Ichimaduvuhalla, Sike Guddai streamlet and western boundary of Hulibanda reserved forest; and west by western boundary of Hulibanda reserved forest.
					Krishnagiri Range.
13 Panjapalli ..	Marandahalli Extension (part).	I	2,006	1,046	North by Tenkal Pallam and eastern boundary of Marandahalli extension reserve forest; east by eastern boundary of Marandahalli extension reserved forest; south by Balkal Pallam and southern boundary of Marandahalli extension reserved forest; and west by Range boundary (Komanur enclosure excluded).
	Do.	II	1,683	1,121	North by Gudur Thandanapalli-Panjapalli footpath, stream rising from 3700 in a northerly direction till it meets the eastern boundary of the reserve; east by eastern boundary of Marandahalli Extension reserved forest; south by Tenkal Pallam; and west by western boundary of Marandahalli Extension reserved forest and eastern boundary of Gudur Thandanapalli enclosure (Tekumaratha Bylu enclosure excluded).
	Do.	III	2,164	1,180	*Bit I.*—North by northern boundary of Marandahalli Extension reserved forest; east by eastern boundary of Marandahalli Extension reserved forest; south up the stream to 3700, Panjapalli-Gudur-Thandanapalli foot-path, eastern, northern and western boundaries of Gudur-Thandanapalli enclosure and Range boundary; and west by Range boundary (Chinnakalpalli and Dod Kalhalli enclosure excluded). *Bit II.*—Two small patches in Hudedurgam reserved forest; on either banks of the Chinnar and along the common boundary of the Hudedurgam and Marandahalli Extension reserved forests.
14 Marandahalli.	Marandahalli (part).	I	3,332	611	North by northern boundary of Marandahalli reserved forest; east by Allanpalli-Bettamugalalam foot-path; south, nil; and west by Range boundary (Mukanekere enclosure excluded).
	Marandahalli.	II	2,785	940	North by northern boundary of Marandahalli reserved forest; east by eastern boundary of Marandahalli reserved forest; south by southern boundary of Marandahalli reserved forest; and west by Bettamugalalam-Allanpalli footpath.
	Marandahalli Extension (part).	III	2,316	1,054	North, nil; east by eastern boundary of Marandahalli Extension reserved forest; south by southern boundary of Marandahalli Extension reserved forest; and west by southern boundary of Marandahalli Extension reserved forest and Balkal Pallam.
15 Galligattam.	Galligattam (part).	I	706	349	North by northern boundary of Galigattam reserved forest; east by stream running south rising from a point within the Bettamugalalam enclosure, south of 4089 Ijalhattikal; south by southern boundary of Galigattam reserved forest; and west by western boundary of Galigattam reserved forest.

Serial number and name of felling series.	*Name of reserve.*	*Coupe number.*	*Total area in acres.*	*Effective bamboo area in acres.*	*Boundary description.*
(1)	(2)	(3)	(4)	(5)	(6)
			Krishnagiri Range—cont.		
15 Galligatam—*cont.*	Gallikatam (part).	II	3,581	785	North by northern boundary of Galligattam reserved forest; east by eastern boundary of Galligattam reserved forest; south by southern boundary of Galligattam reserved forest; and west up a stream to 4132; ridge to Bopanur-Basavannankoil foot-path, the said foot-path, stream rising about 30 chains east of 4132 and running north-east and Basavannankoil-Bettamugalalam foot-path.
	Do.	III	1,913	1,003	North by northern boundary of Galligattam reserved forest; east by Bettamugalalam-Basavannankoil foot-path, the stream running north rising at a point about 30 chains east of 4132, part of Basavannankoil-Bopanur foot-path, ridge to 4132 and a streamlet running south; south by southern boundary of Galligattam reserved forest; and west by up a stream which rises south of 4089 Ijalhatti Kal within the Bettamugalalam enclosure.
			Dharmapuri Range.		
16 Morappur ..	Kesaraguli ..	I	3,566	1,123	North by northern boundary of Kesaraguli reserved forest; east by eastern boundary of Kesaraguli reserved forest and Kargur-Kottayur foot-path; south and west by western boundary of Kesaraguli reserved forest.
	Morappur ..	II	4,644	806	North by northern boundary of Morappur reserved forest; east by Tenkalpallam and line to Kottayur-Morappur foot-path; south by Morappur-Kolamarti foot-path and streams to Morappur reserved forest boundary; west by western boundary of Morappur reserved forest, a line and a line and a streamlet to 3686 Dodda Guddai, another streamlet running east and another streamlet running south rising at a point near 3080 on the northern boundary of Morappur reserved forest.
	Morappur and Tholavubetta Extension.	III	2,043	1,148	North by northern boundary of Tholavubetta Extension reserved forest eastern boundary of Tholavubetta Extension reserved forest northern boundary of Morappur reserved forest; east by a streamlet running south from a point near 3080, a streamlet running east from a point near 3686 Dodda Guddai, a streamlet and a line to eastern boundary of Tholavubetta Extension reserved forest and eastern boundary of Tholavubetta Extension reserved forest; south and west by southern and western boundaries of Tholuvubetta Extension reserved forest.
17 Gudirayam.	Guttirayan.	I	3,070	1,436	North by northern boundary of Guttirayan reserved forest; east by a streamlet from Dombaraparai on the Kodagerai enclosure line to 3650, ridge to Guttirayan Durg 4577, ridge running south to 4380, 3530, 3850, 3210, 2530, 2250, 1740 and a line to Anaibiddahalla; south and west by the Guttirayan reserved forest boundary.
	Do.	II	4,131	1,624	*Bit I.*—North by northern boundary of Guttirayan reserved forest; east by the foot-path from Madapanur to Chinnar (via) Kolmarti upto its junction, another foot-path from Gudumatti, a line south-west to 3600, ridge to 3600 near Arasamarathupatti, thence ridge to 3487 Jadanaimalai, and stream to Anaibidda halla; south by the Anaibidda halla and the southern boundary of Guttirayan reserved forest; west by a line to 1740 and ridge 2250, 2539, 3210, 3530, 4380 and thence to 4577, Guttirayan Durg 3650 and a streamlet to Kodagerai enclosure line.
	Wodapatti ..	II	..	..	*Bit II.*—An area of about 425 acres north, east and west of Muthurmalai in Wodapatti reserved forest.
	Bevanurmalai	..	..	..	*Bit III.*—An area of 47 acres in top of Bevanurmalai in Bevanurmalai reserved forest.
	Badanavadi	..	..	..	*Bit IV.*—Three patches of 66, 18 and 29 acres in Thachumalai of Badanavadi reserved forest.

Serial number and name of felling series.	*Name of reserve.*	*Coupe number.*	*Total area in acres.*	*Effective bamboo area in acres.*	*Boundary description.*
(1)	(2)	(3)	(4)	(5)	(6)
					Dharmapuri Range—cont.
17 Gudirayam—*cont.*	Thoppur ..	..	..	..	*Bit V.*—A patch of 16 acres on the top of Jagunathacombai in Thoppur reserved forest.
	Guttirayan.	III	8,082	2,263	North by northern boundary of Guttirayan reserved forest; east by eastern boundary of Guttirayan reserved forest; south by southern boundary of Guttirayan reserved forest; west by western boundary of Guttirayan reserved forest; Anaibidda halla and the streamlet to Jadanaimalai 3487, ridge 3600 near Arasamarathupatti to another point 3600, line to the junction of the foot-path from Kolamarti and Gudumatti, and the foot-path to Madapanur (via) Kolamarti.
					Anchetti Range.
18 Anchetti ..	Anchetti (part).	I	5,024	1,209	North by northern boundary of Anchetti reserved forest; east by Anchetti-Pennagaram road, Buthumadagu halla, up a streamlet to 2240, along the ridge 2571 Ethan Guddai 2260 along the streamlet due south-west from the last point to Gerhatti foot-path and then the abovesaid foot-path; south by southern boundary of Anchetti reserved forest; and west by western boundary of Anchetti reserved forest.
	Do.	II	1,810	952	North by Buthumadavu halla, up a streamlet 15 chains east of 2010, ridge 3207, 3330 and 3530 and northern boundary of Anchetti reserved forest; east by eastern boundary of Anchetti reserved forest; south by southern boundary of Anchetti reserved forest; and west by Gerhatti-Gollamothi foot-path, up a streamlet to 2260, ridge 2571 Ethan Guddai 2440 and a streamlet to Buthumadagu halla.
	Do.	III	2,720	1,089	North by northern boundary of Anchetti reserved forest; east by ridge along 3530, 3330 and 3207, a streamlet to Buthumadagu halla about 15 chains to the east of 2010; south by Buthumadagu halla and west by Anchetti-Pennagaram road.
19 Urigam ..	Urigam (part).	I	2,497	848	North by Jinamanatham-Potur footpath, western boundary of Attinattam enclosure, eastern boundary of Somugal Betta enclosure, a streamlet from north-east of Somugal Betta; east by Mattur-Maggur Doddi foot-path; south by a stream to the north of Haggur Doddi, Somugal Betta-Kalkuli Doddi foot-path, a streamlet from north-west of 1800, then up a stream to south-east of Belsane Kal, eastern and southern boundaries of Urigam reserved forest and west by western boundary of Urigam reserved forest.
	Do.	II	2,696	992	North by Urigam-Taggati foot-path, eastern boundary of Urigam reserved forest and northern boundary of Taggati reserved forest; east by Sige Halla, up a stream from 1600, and Mattur-Haggar Doddi foot-path; south by up a streamlet from 1730; and west by western boundary of Taggati reserved forest; northern boundary of Attinatham enclosure and Attinatham-Taggati foot-path (via) Hunsepunji.
	Do.	III	36	853	North by Udupurane-Taggati foot-path; east by Taggati-Attinatham foot-path (via) Hunsepunji, northern and western boundaries of Attinatham enclosure; south by Jimanatham-Potur foot-path; and west by western boundary of Urigam reserved forest; and Urigam-Uduparane foot-path.
20 Bilikal ..	Urigam (part).	I	2,008	825	North nil; east by eastern boundary of Urigam reserved forest; south by Tagatti-Udupurane foot-path, Udupurane-Urigam foot-paths up a streamlet to 2970, a streamlet from 2790, then up a stream to north of 2710; and west by western boundary of Urigam reserved forest and Mysore Frontier (Udupurane enclosure excluded).

Serial number and name of felling series.	*Name of reserve.*	*Coupe number.*	*Total area in acres.*	*Effective bamboo area in acres.*	*Boundary description.*
(1)	(2)	(3)	(4)	(5)	(6)
					Anchetti Range—cont.
20 Bilikal—*cont.*	Urigam and Bilikal (part).	II	2,352	848	North by down a stream to the north of 2710, up a streamlet to 2790 and another streamlet from 2790; east by Udupurane-Urigam foot-path, western boundary of Urigam reserved forest and the eastern boundary of Bilikal reserved forest; south by Kovehalli-Biyalapatti foot-path; and west by a line to the ridge north of 2810 from the junction of Kovehalli-Biyalapatti foot-path with the foot-path from Tatakani, ridge along 3170 to Bare Betta 3500, a line due north of Bilikal-Biyalapatti foot-path, the said foot-path and the eastern boundary of Bilikal reserved forest.
	Bilikal (part).	III	1,506	882	North by Mysore Frontier; east by eastern boundary of Bilikal reserved forest; and Bilikal-Biyalapatti foot-path; south nil; and west by western boundary of Bilikal reserved forest and Mysore Frontier.
21 Ubrani ..	Ubrani (part).	I	3,296	368	North by northern boundary of Ubrani reserved forest; east by eastern boundary of Ubrani reserved forest; south by southern boundary of Ubrani reserved forest; and west by Hosur-Gundalam foot-path, Kathiri Halla and Gundalam-Anchetti foot-path.
	Do.	II	1,770	596	North, nil; east by Gundalam-Hosur foot-path; south by southern boundary of Ubrani reserved forest; and west by ridge on the west of Chikbetta hamlet along Chickbetta 3356, 2490, 2587, a straight line due north-east about 15 chains and a streamlet to Kathiri halla.
	Do.	III	2,101	442	North by Kathiri halla; east up a stream 15 chains north-east of 2587, a line due south-west to 2587 and ridge through 2490,3356, Chickbetta; south by southern boundary of Ubrani reserved forest; and west by western boundary of Ubrani reserved forest.
22 Biligundlu ..	Biligundlu (part).	I	4,646	664	North by northern boundary of Biligundlu reserved forest; east by eastern boundary of Biligundlu reserved forest; south and west by Pennagaram-Anchetti road and western boundary of Biligundlu reserved forest.
	Biligundlu and Natrapalayam (parts).	II	8,620	698	*Bit I*—North by Anchetti-Pennagaram road; east by foot-path about 10 chains south-east of 1720 to Kallumaduvu halla and then the said halla; south up the streamlet from Chellappana Betta to Kallumaduvu halla, and west by western boundary of Biligundlu reserved forest. *Bit II.*—North by Bekkuppa-Natrapalayam foot-path; east by eastern boundary of Natrapalayam reserve forest; south by Cauvery river; and west by Ganatti halla, up a streamlet from Kenga Betta 2540, thence west along a ridge, thence along streamlets to the northern boundary of the coupe.
	Natrapalayam (part).	III	2,673	599	North by northern boundary of Natrapalayam reserved forest; east by eastern boundary of Natrapalayam reserved forest; south by Natrapalayam Bekkuppa foot-path; and west by western boundary of Natrapalayam reserved forest.
					UNRESERVE SECTION.
					Denkanikota East Range.
1 Manchi ..	Manchi (part).	I	324	360	North by northern boundary of Manchi enclosure; east by foot-path from Sivanapalli to Talavadi (via) Chick Manchi; south by southern boundary of Manchi enclosure; and west by western boundary of Manchi enclosure.
		II	242	242	North nil; east by Chick Manchi-Ganahatti foot-path and down a streamlet rising south-east of 3400; south by southern boundary of Manchi enclosure and west by Talavadi-Chick Manchi foot-path.

Serial number and name of felling series.	Name of reserve.	Coupe number.	Total area in acres.	Effective bamboo area in acres.	Boundary description.
(1)	(2	(3)	(4)	(5)	(6)
			UNRESERVE SECTION—*cont.*		
			Denkanikota East Range—cont.		
1 Manchi—*cont.*	Manchi (Part) —*cont.*	III	317	317	North by northern boundary of Manchi enclosure; east by eastern boundary of Manchi enclosure; south by southern boundary of Manchi enclosure; and west by a streamlet rising from south-east of 3400 till it meets the junction of Ganahatti-Manchi foot-path and the said path.
			Denkanikota West Range.		
2 Madakallu ..	Madakallu (part).	I	2,513	267	North by Nandimangalam Zaghir southern boundary and western boundary of Pane reserved forest; east by foot-path from Padiganalam to Arulnattam (via) Hosadoddi till it meets the eastern boundary of Hulibanda reserved forest; south nil; west by the eastern boundary of Hulibanda reserved forest.
		II	3,282	443	The unreserves of Madakkallu; east of foot-path from Padiganalam to Arulnatham (via) Hesadoddi till it meets the eastern boundary of Hulibanda reserved forest.
	Anchetti ..	III	6,214	875	The unreserves of Anchetti village.
3 Kanchuvadi.	Part of Palayamkotta and part of Agalacota.	I	5,125	763	The unreserves lying north of Pane reserved forest; east of Avalagiri reserved forest; and west of foot-path from Padiganalam to Palayamkotta (via) Kurimandai.
	Part of Palayamkotta and part of Agalacota.	II	7,070	786	The unreserves lying north of Pane reserved forest; east of the foot-path from Padiganalam to Palayamkotta (via) Kurimandai and west of the foot-path from Pane to Bilimudrai and thence to Palayamkotta.
	Part of Karandapalli and Mallikarjunadurgam.	III	6,339	1,055	The unreserves north of Pane reserved forest; east of the foot-path from Pane to Palayamkotta (via) Bilimudrai and west of Anchetti-Denkanikota road.
			Anchetti Range.		
4 Natrapalayam.	Natrapalayam.	I	2,589	190	North by northern boundary of Natrapalayam enclosure; east a streamlet to 2828, ridge 2990, Mari Guddai 2760 and eastern boundary of Natrapalayam enclosure; south by Kallumaduvu-Battigondanur foot-path and west by Battigondanur-Gerhatti foot-path.
		II	435	165	North by streamlet rising about 10 chains, south of 2828, Kallumaduvu halla up a streamlet above 25 chains south of 1970 and a line north-east to a point on the boundary, about 30 chains north-west of 2090; east by eastern boundary of Natrapalayam enclosure; south nil and west by ridge 2760, 2900 Mari Guddai to the starting point of the northern boundary.
		III	600	158	North by northern boundary of Natrapalayam enclosures; east by eastern boundary of Natrapalayam enclosure; south by a line about 30 chains north-west of 2090 and a streamlet 25 chains, south of 1970 to Kallumaduvu halla, Kallumaduvu halla and up a streamlet to a point on the ridge about 10 chains south of 2828 and west by ridge 2823 and a streamlet from 2828 the starting point.

SECTION 6—OTHER REGULATIONS.

288. *Grazing Regulation.*—The working circle will, as a whole, remain open to grazing.

289. *Fire Protection.*—The protection from fire of the forests included in the Bamboo Working Circle is dealt with in a later chapter (Chapter XIII—Miscellaneous Regulations). The contractors shall be bound under their agreement to keep out fires from their leased areas and to render all assistance in putting out fires within their areas, free of cost.

290. *Publicity for bamboo sales.*—It was suggested in the last working plan that to attract the right type of contractors for working bamboo coupes, it would be desirable to give wide publicity to auction sales of bamboo coupes in Bangalore and Salem and, if possible, to hold the auction sales at these two centres. Actually the sales of bamboo coupes

of Anchetti and Denkanikota East and West Ranges is being held at Hosur Cattle Farm and of the other ranges, at the respective range headquarters. The bamboo coupe contractors come from Denkanikota, Pennagaram and Alangayam. No change is called for in the existing practice of giving publicity to auction sales of bamboo coupes.

291. *Improvement of communications in the working circle.*—This point is dealt with in Chapter XIII.

292. *Publication of felling rules.*—It was suggested in the last working plan that the bamboo felling rules translated into Tamil and Kanarese languages and printed at the back of bamboo permits and that, in every bamboo coupe under working, a notice board with the felling rules inscribed on it should be placed. This suggestion has not been acted upon for the main reason that probably 99 per cent of the felling coolies are illiterate and therefore expenditure to be incurred in printing special permits and erecting notice boards was not justified. The suggestion will not therefore be re-introduced in the present working plan.

293. *Road-making by bamboo contractors.*—Before making a new cart-track within or outside his bamboo coupe or felling series for the extraction of bamboos, the contractor should obtain the previous sanction of the District Forest Officer. His proposed alignment must also be approved.

294. *Records of statistics.*—The contractors shall be required to submit accounts monthly of all bamboo removed by him from each coupe not later than 15th of the following month. The annual totals of the outturn shall be entered in the Control Book.

295. *Control.*—A summary of operations in the working circle shall be entered in the Control Book for each financial year. A specimen of the form to be used will be found in Appendix VI.

CHAPTER IV—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

296. *General constitution of the working circle.*—The Fuel Working Circle comprises of the selected blocks of reserved forests in the vicinity of certain towns and villages, where the demand for firewood exists. It has been formed to include the reserved forests (i) on the Hosur Plateau and its fringe sloping towards the Cauvery, (ii) in the neighbourhood of the Cauvery valley and (iii) in Krishnagiri range.

297. *Area.*—The aggregate area of the working circle is 41,400 acres.

298. *Felling series.*—The working circle is divided into 17 felling series and they are shown in the following statement :—

Range.	*Felling series.*	*Reserved forests.*	*Area in acres.*
(1)	(2)	(3)	(4)
Denkanikota, West ..	Sanamavu	Sanamavu	2,400
Dharmapuri	Muthur	Guttiroyan and Woddapatti	2,250
	Bevanur	Bevanurmalai and Pennagaram ..	2,400
	Pennagaram	Pennagaram	2,400
	Masakal	Masakal	2,400
	Cauvery valley	Badanavadi	2,400
	Badanavadi	Perumbalaimalai	3,000
	Perumbalaimalai	Perumbalaimalai	3,000
	Parigam	Parigam, B.	2,400
	Thoppur	Thoppur	3,000
Krishnagiri	Hudedurgam	Hudedurgam	1,800
	Naralapalli	Naralapalli	2,400
	Maharajagadai, West ..	Maharajagadai	3,750
	Maharajagadai, East ..	Do.	3,750
	Bargur	Bargur	1,350
	Nandibanda	Nandibanda	1,350
	Kothur	Kothur	1,350

NOTE.—In Muthur series, 16 coupes of 1,200 acres fall in Anchetti Range and the rest of 14 coupes of 1,050 acres fall in Dharmapuri Range.

299. As the coppicing capacity of the felled stumps in Denkanikota reserved forest has been found to be poor and as the demand for fuel from Denkanikota and its neighbouring villages can be met with from the surrounding mitta forests and unreserves, no felling series has now been formed in Denkanikota reserved forest though one was formed in it according to the last working plan.

300. *Character of vegetation.*—The type of forest included in the working circle is mixed deciduous scrub, varying in density from place to place. Sanamavu reserved forest on the Hosur Plateau contains a fair sprinkling of sandal in its young stage but the question of the supply of fuel to Hosur town is so important that it is felt that sandal interests in this reserved forest should be subordinated to the production of fuel. Sandal is poorly represented in Pennagaram reserved forest of Dharmapuri range.

301. The prevailing fuel species occurring in the reserved forests included in the working circle are as follows :—

Serial number and name of species.

1 Albizziaamara.
2 Erythroxylon monogynum.
3 Canthium didymum.
4 Acacia leucophloea.
5 Dichrostacyys cinerea.
6 Chloroxylon sqietenia.
7 Bauhinia racemosa.
8 Acacia sundra.
9 Dalbergia paniculata.
10 Azadirachta indica.
11 Zizyphus jujuba.
12 Zizyphus xylopyra.
13 Gmelina asiation.
14 Gmelina pubeseens.
15 Randia dumetorum.
16 Strychnos nux-vomica.
17 Strychnos potatorum.
18 Gyrocarpus jacquini.
19 Butea frondosa.

Serial number and name of species.

20 Ixora parviflora.
21 Cordia monoica.
22 Cassia fistula.
23 Diyospyros melanoxylon.
24 Albizzia odoratissima.
25 Albizzia lebbek.
26 Tamarindus indica.
27 Diospyros mentana.
28 Atalantia monophylla.
29 Erightia tinctoria.
30 Pongamia glabra.
31 Zizyphus trinervia.
32 Protium caudatum.
33 Feronia elephantum.
34 Terminalia belerica.
35 Schleichera trijuga.
36 Holoptelia integrifolia.
37 Carissa carandas.

NOTE.—Sandal is not included in the above list.

302. *Rotation.*—A rotation of 30 years was prescribed by Messrs. C. R. Ranganathan and V. S. Kuppuswamy in the last working plans prepared by them and a rotation of 40 years was prescribed for the fuel coupes of Krishnagiri range in the last working plan prepared by Mr. A. R. Brand. Taking into consideration the coppicing capacity of the felled stumps included in the working circle, a uniform rotation of 30 years will be adopted for all the felling series, as it is believed that a longer rotation will entail a risk of not securing vigorous coppice regeneration adequately.

SECTION 2—METHOD OF TREATMENT.

303. The method of felling proposed for fuel coupes is simple coppice, with the reservation of *sandal*, *tamarind* and *soapnut*. Other valuable species may also be so reserved by the District Forest Officer with the sanction of the Conservator. With the exception of the reserved species, all tree growth must be clear felled.

304. *Regulation of working.*—The felling will be regulated by area. Each felling series has been divided into 30 coupes of more or less equal area. The coupes have been marked in the maps accompanying this working plan. Well in advance of the sale of the coupes, they will be surveyed and demarcated by 15 feet wide cut lines except where natural feature form the boundary. The correct area of the coupes to be sold will be computed on the basis of their survey and such surveyed areas only should be mentioned in the sale notice of fuel coupes. Unless a departure from the boundaries of the coupes as indicated in the working

plan maps is involved on account of any unforeseen difficulties on the ground, differences between the nominal area of the coupe and its surveyed area will not constitute a deviation requiring sanction.

305. One coupe in each felling series shall be offered for felling every year in the sequence indicated in the tabular statement of fellings, which does not indicate, however, the particular years in which the coupes are to be felled. If, for any reason, a coupe cannot be worked in any year, no deviation is involved but the fact that the coupe cannot be worked and the reason therefor should be recorded in the Control Book.

Section 3—Method of executing the Fellings.

306. Each coupe will be divided under the orders of the District Forest Officer, into a convenient number of strips on the ground by means of 10 feet wide cut lines. There shall not be less than two strips nor more than four strips in a coupe. In coupes situated on hill slopes, the strips shall invariably run across the contours so that the strip lines will be perpendicular, or nearly so, to the contour lines. The arrangement of strips should normally be such that last strip adjoins the next coupe.

307. *Agency of fellings.*—The fellings shall invariably be made through the agency of contractors. If a coupe cannot be sold in any year, it shall not be worked ; sellings on permit or departmental fellings shall not be resorted to in such cases.

308. The coupes shall be sold every year in public auction. The lease period shall be from 1st January to 31st December of the year.

309. Coupes left unsold in public auction sale, but sold subsequently in special sale or on tender should be leased only for the period ending 31st December of the year.

310. *Coupe arrears.*—In the event of any portion of coupe remaining unfelled at the close of the lease period, such unfelled portion will be surveyed area computed and sold in public auction.

311. *Felling rules.*—The coupe shall be felled strip by strip. Fellings in one strip shall be completed and passed as satisfactory by the Range Officer after his personal inspection before the contractor is allowed to commence felling in the next strip.

312. All fellings in the coupe shall be made only by coolies of the concerned coupe contractor, who or whose authorized agent shall be present during the fellings.

313. The cutting of the trees must be close to the ground. The bark must not be separated from the woody portion of the stool. Sharp axes and bill-hooks shall be used in the felling of the trees.

314. Any brushwood of the felled trees should not be allowed in the coupe in such a manner to so cover the felled stools as to obstruct the coppice shoots coming from the stools.

315. *Disposal of felled material.*—All felled firewood shall, prior to its removal from the coupe, be billetted and stacked. The stacks should preferably be of standard size in all coupes and the dimensions 5 feet by 4 feet by $2\frac{1}{2}$ feet making up 50 stacked cubic feet are recommended. Removal of firewood by any one before stacking shall not be permitted. The above condition does not apply to the removal of brushwood by head-loads on permit.

316. Trees yielding timber shall, on felling, be hammer marked by the concerned beat Forest Guard before removal. If the timber trees are sawn or otherwise converted *in situ*, the sawn or converted pieces shall be so hammer marked.

SECTION 4—TABULAR STATEMENT OF FELLINGS.

317. The sequence of fellings in the various felling series is shown in the following statement, in which are given details of coupes to cover the whole period of rotation of 30 years :—

Statement showing the division of the fuel felling series.

Serial number and name of felling series.	*Name of reserved forest.*	*Coupe number and area in acres.* I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
		Denkanikota West Range.															
1 Sanamavu ..	.. Sanamavu	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
		Dharmapuri Range.															
2 Badanavadi..	.. Perumbalaimalai	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
3 Bevanur ..	.. Bevanur	80	80	80	80	80	80	80	80	..	..	..	..	..	..	..	..
	Woddapatti	..	..	..	..	..	..	..	..	80	80	80	80	80	80	80	80
	Pennagaram	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4 Cauvery valley	.. Badanavadi	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
5 Masakal ..	.. Masakal	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
6 Muthur ..	.. Guttirayan	75	75	75	75	75	75	75	75	75	75	75	..	..	..	..	..
	Woddapatti	..	..	..	..	..	..	..	..	..	..	..	75	75	75	75	75
7 Parigam ..	.. Parigam, B.	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
8 Pennagaram	.. Pennagaram	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
9 Perumbalaimalai	.. Perumbalaimalai	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10 Thoppur ..	.. Thoppur	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
		Krishnagiri Range.															
11 Bargur ..	.. Bargur	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
12 Hudedurgam	.. Hudedurgam	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
13 Kothur ..	.. Kothur	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
14 Maharajagadai, East.	Maharajagadai (part) ..	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
15 Maharajagadai, West.	Maharajagadai (part and extension).	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125
16 Nandibanda	.. Nandibanda	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
17 Nerlapalli ..	.. Nerlapalli	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80

Serial number and name of felling series.	Name of reserved forest.	Coupe number and area in acres.														Total area in acres.
		XVII.	XVIII	IX	XX	XXI	XXII	XXIII	XXIV	XXV	XXVI	XXVII	XXVIII	XXIX	XXX	
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)
		Denkanikota West Range—cont.														
1 Sanamavu ..	.. Sanamavu	80	80	80	80	80	80	80	80	80	80	80	80	80	80	2,400
		Dharmapuri Range—cont.														
2 Badanavadi..	.. Perumbalaimalai	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3,000
3 Bevanur ..	.. Bevanur	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,400
	Woddapatti	80	80	80	80	80	..	..	..	..	..	..	..	..	..	
	Pennagaram	..	..	..	..	..	80	80	80	80	80	80	80	80	80	
4 Cauvery valley ..	Badanavadi	80	80	80	80	80	80	80	80	80	80	80	80	80	80	2,400
5 Masakal	Masakal	80	80	80	80	80	80	80	80	80	80	80	80	80	80	2,400
6 Muthur	Guttirayan	..	..	..	..	..	..	..	..	..	..	75	..	75	75	2,250
	Woddapatti	75	75	75	75	75	75	75	75	75	75	..	75	..	..	
7 Parigam	Parigam, B..	80	80	80	80	80	80	80	80	80	80	80	80	80	80	2,400
8 Pennagaram ..	Pennagaram	80	80	80	80	80	80	80	80	80	80	80	80	80	80	2,400
9 Perumbalaimalai ..	Perumbalaimalai	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3,000
10 Thoppur	Thoppur	100	100	100	100	100	100	100	100	100	100	100	100	100	100	3,000
		Krishnagiri Range—cont.														
11 Bargur	Bargur	45	45	45	45	45	45	45	45	45	45	45	45	45	45	1,350
12 Hudedurgam ..	Hudedurgam	60	60	60	60	60	60	60	60	60	60	60	60	60	60	1,800
13 Kothur	Kothur	45	45	45	45	45	45	45	45	45	45	45	45	45	45	1,350
14 Maharajagadai, East.	Maharajagadai (part) ..	125	125	125	125	125	125	125	125	125	125	125	125	125	125	3,750
15 Maharajagadai, West.	Maharajagadai (part and extension).	125	125	125	125	125	125	125	125	125	125	125	125	125	125	3,750
16 Nandibanda ..	Nandibanda	45	45	45	45	45	45	45	45	45	45	45	45	45	45	1,350
17 Nerlapalli ..	.. Nerlapalli	80	80	80	80	80	80	80	80	80	80	80	80	80	80	2,400

SECTION 5.—SUBSIDIARY SILVICULTURAL OPERATIONS.

318. Artificial regeneration by *rab* sowings in felled fuel coupes was conducted with reference to last working plan till 1940–41. This work was discontinued in pursuance of a " note on regeneration policy in dry duel forests " issued by the Chief Conservator of Forests in 1940. In the course of note, the Chief Conservator observed :—

" I have for long been very doubtful about our *rab policy*. A very great deal of hard and determined work has been put into it, and astonishing results in the way of rapid initial growth have been obtained in most places, where the work has been well done ; and a great deal of valuable silvicultural knowledge has been gained. But in many places the results are pathetic.

" I will not go at length into the familiar criticisms of the system—its diffuseness, the difficulty of arriving at results, the hidden costs, the demoralising practice it is apt to lead to, the enormous amount of time devoted to it by all ranks (to the detriment of general protection), the destruction of stools in the rab line and so on. The crucial objection to our present policy—and this applies to kumri as well as rab—is that our choice for the scene of artificial regeneration operations is limited to the area that happens to constitute the coupe of the year, irrespective of its quality.

" The remedy I propose is this : At the time of working plan revision the best accessible areas will be picked out from the fuel areas and will be made into a separate working circle, in which *complete* artificial regeneration will be done. The rest of the fuel areas will be worked as simple coppice, without artificial regeneration . . . "

319. No artificial regeneration in the fuel working circle is, therefore, prescribed. The felled fuel coupes will be left to regenerate themselves through coppice regrowth.

320. A separate working circle called the Fuel Plantation Working Circle has been formed and dealt with in Chapter V.

SECTION 6—OTHER REGULATIONS.

321. *Demarcation of worked coupes.*—Soon after the completion of fellings in a coupe, the corners of the coupe will be demarcated with stone slabs, which will show the coupes' number and the year of its working.

322. *Grazing Regulations.*—The felled fuel coupes shall remain closed to grazing for four years including the year of felling.

323. Where cattle have to pass through any such closed coupe, the cattle path in such coupe shall be demarcated with a margin on either side, half a chain wide and the path excluded from the closure.

324. Cutting and removal of grass from the ' closed ' coupes may be allowed free of cost.

325. *Fire protection.*—Intensive measures of fire protection for felled fuel coupes by maintaining the coupe lines already demarcated on the ground and providing for their annual clearance were prescribed in the last working plan because the felled fuel coupe were required to be permanently closed to grazing and the absence of grazing would result in heavy growth of grass gravely increasing the danger of fire. But as, according to the present working plan, the felled fuel coupes are to be closed to grazing only for four years ; no fire protection measures are prescribed specially for the fuel working circle, apart from what is prescribed under fire protection for the whole division in Chapter XIII.

326. *Record of statistics.*—Every contractor shall be required to submit to the range Officer monthly statement of yield of firewood, and timber, if any, from his coupe not later than the 15th of the following month. Such statement shall show particulars of (1) the number of stacks felled during the month, (2) the number of stacks removed during the month, and (3) the balance number of stacks not removed. The quantity of fuel removed on head-load tickets should also be furnished in the appropriate column of the statement. In the case of timber, if any, information as regards species and quantity in cubic feet shall be furnished in the respective columns of the statement.

327. The total yield during the year, of fuel and timber for each coupe should be recorded in the Control Book after obtaining the information from the Range Officer.

328. *Control.*—Particulars connected with the working of the fuel coupes in each series shall be recorded for each year in a Control Book, which must be maintained in the District Forest Office. Particulars of subsidiary works done in the coupes of each series such as demarcation of coupes, etc., shall be entered for each year in the Record of works. Specimen forms of Control Book and Record of works will be found in Appeudix VI.

329. *Control Maps.*—In the detailed maps accompanying this working plan, the limits of coupes prescribed for working are marked only approximately. After the completion of fellings in each coupe, the area actually worked should be marked on the map in a distinctive manner and the year of working noted in the middle. Where coupe arrears are worked subsequently (vide paragraph 310), the year of working should be noted in the arrear area. Where the coupe leased out differs in boundaries from that prescribed, the boundary as surveyed should be marked by dotted lines and the surveyed area also noted.

CHAPTER V—WORKING PLAN FOR THE FUEL PLANTATION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

330. *Introduction.*—In the last working plan, a firewood plantation working circle was prescribed, as an experimental measure, to ascertain whether the raising of *Cassia siamea* plantation for eventual exploitation as firewood or charcoal was silviculturally simple and financially profitable. The working circle was formed in two detached blocks of forest in the Sanamavu reserve. Attempts were made to raise *Cassia siamea* plantations over an aggregate area of 20 acres between 1935–36 and 1938–39 at the rate of 5 acres each year, but the plantations were found to be a failure. No more attempts to introduce this species were made thereafter.

331. In the Note on the Regeneration Policy in dry fuel forests issued by the Chief Conservator in 1940 (vide paragraph 318) he stated :—

" . . . a division might have, in place of a fuel working circle of (say) 30 or 40 felling series with rab or kumri regeneration in each :—

(i) A coppice working circle of roughly the same number of felling series, without artificial regeneration ;

(ii) a much smaller regeneration or conversion working circle of perhaps 5 or 6 felling series.

" Artificial regeneration would thus be concentrated in one or two good localities in each range. It would be over the whole of the annual coupe. Real supervision and proper tending of the young crops would thus become practicable.

" The crops to be raised artificially in this way would of course vary according to circumstances. They might be fully stocked with fuel and small timber species, or with bamboos, or regeneration might be in lines of trees in improved pasture.

" Regeneration would be Kumri wherever possible and the fact that it would be in chosen areas would be attraction to Kumridars, ' Departmental Kumri ' would be the second string.

" It might be objected that the poorer areas are those most in need of artificial help. To this I would say that the present rab and Kumri methods by no means improve the *protective* qualities of these areas, and that with the concentration of effort on improving the outturn of the most productive areas the poorest can eventually be cut out altogether from working.

" Difficulties might arise from a shortage of slash for complete regeneration of the entire coupe. These can probably be met by more intensive soil working, or when necessary by regeneration in lines with improved pasture intervening.

" It is not suggested that the abandonment of rab and Kumri in the ordinary fuel coupes should check the spread of the system deferred or rotational grazing in worked coupes.

" It will not in fact make it easier, as there will be no regeneration lines to be anxious about. It is not proposed that the change I have outlined should await the revision of the working plan in each district. It can be effected at once. For this purpose it is not necessary for Distrct Forest Officer to attempt to map out areas to be allotted to the ' Regeneration ' working circle. Pending working plan revision it will be sufficient to select, fell and regenerate annually with the principles now put forward an area of (say) 20 acres in each range. More could be done in divisions where kumri work is advanced, and where it is backward more modest beginnings could be made. Heaping of slash for rab and kumri in the ordinary fuel coupes would cease with the coupes worked in 1940–41."

332. *Constitution of the Working Circle.*—In pursuance of the above policy, Mr. E. A. Lasrado, prepared a tentative working scheme for the regeneration of selected suitable forest areas, by ' kumri ' method in North Salem division. The above scheme included two blocks in Thoppur reserved forest selected for regenerating with fuel species, by ' kumri ' method. Blocks I and II in Thoppur reserved forest will therefore constitute the plantation working circle under this working plan.

333. *Area.*—The area of the working circle is 960 acres, viz., Block I, 400 acres and Block II, 560 acres.

334. *Character of Vegetation.*—The vegetation in the selected blocks is a degraded, deciduous scrub of inferior species ; which is estimated to yield about one to two tons per acre. The poor quality of the present growing stock is by no means an index of the soil conditions supporting it ; the degraded nature of the present growth may be attributed to the continued and indiscriminate hacking in the past which resulted in the loss of vigour of the stumps to produce good and adequate coppice growth to reclothe the area satisfactorily.

335. *Plantation series.*—The whole area will form one plantation series. In Block I 238 acres and in Block II, 106 acres have already been kumried. The balance area available for kumri regeneration in future years will therefore be 162 acres in Block I and 454 acres in block II or 612 acres in both the Blocks.

336. The whole area will be divided into six Planting Blocks of 100 acres each. The following statement shows the location of each planting block and its area :—

Name of reserved forest included in the working circle.	*Total area of the reserve forest included in the Working Circle.*	*Area previously regenerated.*	*Balance area available for regeneration.*	*Planting Block.*	*Area.*
	ACS.	ACS.	ACS.		ACS.
Thoppur Block I	400	238	162	I	100
				II (*a*)	62
Thoppur Block II	560	106	454	II (*b*)	38
				III	100
				IV	100
				V	100
				VI	112

NOTE.—The area of planting Block VI has been adopted as 112 acres for purposes of arithmetical convenience.

SECTION 2—METHOD OF TREATMENT.

337. *Allocation of areas to kumridars.*—Selection of kumridars is an important factor on which the success of kumri cultivation will depend. Past experience in this reserved forest has shown that the kumridars, though not unwilling to take up lands for kumri cultivation in the first instance, showed gradual lack of interest and enthusiasm in the raising of tree crops or neglected the tree crops raised by them during the time the regeneration plots remained in their custody. The District Forest Officer shall therefore exercise utmost care in selecting kumridars, who will turn out satisfactory work and who, after getting the land in the first instance, will not retract subsequently.

338. The extent of land that should be allotted to a kumridar shall not exceed five acres at a time. Within this maximum limit, the allocation of areas each time must be made with reference to the capacity and earnestness of the individual kumridar, whose circumstances must be carefully investigated by the District Forest Offier before adjudging his merits for the grant of the land.

339. The total area which may be given for regeneration to a group of kumridars shall be limited to 100 acres at a time. This limit is considered necessary from the view point of supervision of kumri work, by the executive staff, since a larger area, if given, may suffer from insufficient, supervision involving unsatisfactory results. The areas given to the different kumridars at a time shall as far as possible, be confined to one compact locality.

340. *Issue of permits under section* 21, *of the Madras Forest Act.*—The District Forest Officer shall issue to each of the selected kumridar a permit under section 21 of the Madras Forest Act in respect of the forest land allotted to him for kumri cultivation. The permit will be renewed annually for five years. At the expiry of five years the area will revert to the Forest Department.

341. The permit under section 21 shall contain suitable conditions, which should aim at safeguarding the interests of the Forest Department in regard to the successful regeneration of the area concerned and in all other aspects such as protection of the adjoining Forests from theft of forest produce, from illicit grazing, from fire, etc. As the success of ' kumri ' method of regeneration will depend on the willing co-operation of the kumridars, care should be taken not to include any condition in the permit which will cause undue hardship to the kumridars.

342. *Survey and demarcation.*—After having selected the kumridars and fixed the area to be given to them for the year, the area containing all the individual plots of the land shall be surveyed and demarcated as one planting block, within which, the concerned kumridar will be shown his respective area for working. The areas should be handed over to the kumridars before the middle of January.

343. *Clearing the land.*—It is not proposed to fell the growth on the land, departmentally. Each kumridar will clear-fell all the growth in the area allotted to him and remove the felled material for his own use after leaving sufficient material required for fencing the area. Sufficient quantity of slash and brushwood shall also be kept in the area for burning. The felling shall be completed by the end of March.

344. *Burning and ploughing.*—The brushwood and slash obtained from the area shall be heaped in different places all over the area and burnt and the resultant shall be raked into the soil when the area is ploughed later. Early in May or soon after the rains set in, the whole area will be ploughed and, as stated above, the available ash raked into the soil.

345. *Laying out Belts for sowing seeds of tree crop.*—The belt for tree crop shall be 4 feet wide and 22 feet apart from centre to centre. They should be laid out from east to west, so as to reduce the shade of the tree crop falling over the food crop, which will be raised in the intervening space between the belts. The forester concerned shall supervise the laying out of the belts.

346. *Tree crop species to be introduced.*—Seeds of *Prosopis juliflora, Albizzia amara, Albizzia lebbek, Azadirachta indica, Acacia ferruginea, Wrightia tinctoria, Pithecolobium dulce*, and *Eugenia* species shall be sown mixed in the 4 feet wide belt. The sowing shall be completed by the end of May. Sufficient care shall be bestowed by the Range Officer in the selection of good quality seeds for sowing. The Forester concerned shall supervise the sowing.

347. *Soil Working and Weeding.*—Soil working and weeding in the tree crop belts shall be carried out in—

(i) August, October and December in the first year ;

(ii) May, August, October and December in the second and third years.

348. No soil working and weeding work may be necessary after the third year generally. The success of the regeneration will depend largely on the timely attention paid to this important work. Hence, the Range Officer shall visit the kumri areas frequently during the first three years and ensure that this work is not neglected or imperfectly done by the kumridars.

349. *Thinning.*—It is desirable to thin the seedlings when they are about 12 inches high to remove congestion. Subsequent thinnings should be done by spacing the plants equal to the height of the plants at the end of the first, second and third growing seasons. A simple way to get the spacing is to take a stick and measure the average plant in a tree-line and use that as the guide in thinning the plants in the line.

SECTION 3—OTHER REGULATIONS.

350. *Raising of food crops.*—The beat guard shall be responsible to see that when the intervening belts are cross-ploughed for raising food crops, the tree crop in the belts is not damaged. The kumridars shall not be allowed to raise cholam and castor, until the tree crop is about 6 feet high in order that the tree crop is not suppressed by such food crop.

351. *Growing of grass.*—At the end of the fifth year and before the areas are re-delivered to the Department the kumridars shall be required to plough the food-crop belts. Seeds of spear grass shall be sown in these belts departmentally.

Normally about 30 lb. of uncleaned seeds may be sufficient for sowing over an acre.

352. *Grazing.*—The kumried areas shall be closed to grazing for 7 years including the year of the commencement of the kumri work. On the expiry of the seventh year, 'Rotational Grazing' may be introduced in the kumried areas at the rate of 3 acres per cow unit.

353. *Fire protection.*—No special measures of fire protection are prescribed. The beat staff, as part of its normal duties, shall be responsible to see that the kumried areas are not subjected to fires.

354. *Control Registers.*—The following control records shall be maintained in the District Forest Office :—

(1) Register showing the allotment of lands for kumri cultivation.

(2) Control journal.

355. The Register showing the allotment of lands for kumri cultivation shall give the name and address of the kumridar, the extent of land given to him and any other details which in the opinion of the District Forest Officer will be useful for future reference.

356. The Control Journal should be written up at the end of every year, more or less in a running form. Essential information such as dates in which the several operations prescribed were carried out in each individual area and the general result of the tree crop in such areas should be recorded. To this end, the District Forest Officer may, at his discretion, give the information in tabular statements in the Control Journal. Hence no special form is prescribed in this working plan.

357. *Control map.*—A map on a scale of 4 inches to 1 mile shall be maintained in the District Forest Office. All the areas regenerated by kumri method shall be marked on the map.

CHAPTER VI—CASUARINA PLANTATION WORKING CIRCLE.

SECTION 1—CONSTITUTION OF THE WORKING CIRCLE AND THE CHARACTER OF VEGETATION.

358. *General.*—The planting of casuarina was attempted in North Salem Division as an experimental measure from 1941–42 to 1945–46 in small areas varying from one acre to ten acres in seven reserved forests. Though the result was a failure in Javalagiri and Bevanurmalai reserved forests, the casuarina plantations in Sanamavu, Thalli, Aiyur, Hudedurgam and Gulhatti reserved forests have shown fairly satisfactory results ; the height growth of the existing stand is satisfactory though the stems are thinner and the stocking poorer than they should normally be. However, these experimental plantations, which have been raised without watering, show that the soil is favourable for raising casuarina. Better results could probably be achieved if more attention is paid to the technique of planting and to the cultural operations subsequent to planting. The value of casuarina as the saviour of the fuel problem has been recognized and it is, therefore, considered desirable to continue the planting of casuarina in suitable localities in the division on a modest scale under definite prescriptions.

359. As the method of treatment in the casuarina working circle will be different from that adopted for the fuel plantation working circle, it is considered more convenient to deal with casuarina plantation in a separate chapter.

360. *Constitution of the working circle and area.*—The working circle is composed of selected blocks of 30 acres in Sanamavu reserved forest, 75 acres in Noganur reserved forest and 75 acres in Hudedurgam reserved forest, all the reserved forests being situated on the Hosur Plateau.

361. *Character of the vegetation.*—The vegetation on the forest areas included in the working circle is dry deciduous scrub of inferior species of varying density. The soil is fairly loamy and sandy. The average rain fall in the localities selected varies from 30″ to 40″ annually.

362. *Division of the working circle into plantation series and annual planting areas.*—The area in each of the reserved forest will form a series. Thus, there will be three plantation series in the working circle.

363. The total area in each of the series will be divided into 15 planting areas, each planting area being allotted for planting every year commencing from 1949–50. Thus, there will be—

(i) Fifteen annual planting areas of two acres in Sanamavu reserved forest.

(ii) Fifteen annual planting areas of five acres each in Noganur reserved forest.

(iii) Twelve annual planting areas of five acres each in Hudedurgam reserved forest.

SECTION 2—METHOD OF TREATMENT.

364. The method of treatment adopted shall be to replace the existing forest growth in the working circle by planting casuarina. The question of determining a correct, effective and cheap method of raising casuarina in dry fuel forests in this Province has been engaging the attention of the Forest Officers for some time past. To this end, experiments are being conducted in Chingleput division but no results have yet been obtained. The method followed in the raising of casuarina in North Salem division was what is known as the "Mysore technique" under which the casuarina seedlings are planted in one-foot cube pits without watering being done after planting. The same method will be continued in the casuarina plantation working circle prescribed in this working plan.

365. *Survey and demarcation.*—The planting area of the year should be surveyed and demarcated before the end of December. At the same time any sandal tree containing heartwood, which is found in the area should be extracted departmentally. The area to be planted each year should be taken up in the sequence shown in the maps. A sign-board noting the year of planting should also be put up at convenient corners of the plantation.

366. *Felling the growth.*—The tree growth in the area shall be sold to a contractor in public auction, with the condition that the purchaser shall clear-fell the area, remove the felled material and hand back the area to the Department by the 31st March. The contractor shall not be permitted to remove any firewood below 6″ in girth and all brushwood and slash.

If, for any reason, no purchaser is available in any year, the growth in the area shall be clear-felled departmentally, and the felled material sold *in situ* in public auction.

367. *Burning.*—The area will then be cleared of all growth including coppice regrowth if any, and the cut material thoroughly burnt after it gets dry, taking precaution that the fire does not escape into the adjoining areas. This work shall be completed by the end of April.

368. *Alignment and pitting.*—Immediately after burning, the planting area should be aligned and pits of 1′×1′×1′ dug at an espacement of 6′×6′. This work should be completed in May.

369. *Planting.*—One year old casuarina seedlings raised in the Central Nursery (vide paragraph 375) shall be planted in the prepared pits as soon as the south-west monsoon starts and the ground is fairly wet. The planting shall be done in rains.

370. Casualties will be replaced as and when noticed. The replacement of casualties also shall be done in rains. This work shall be repeated, where necessary, till October. If necessary replacement of casualties may be continued during the second year also, in order to obtain full stocking.

371. No watering is required to be done in the plantation.

NOTE.—As seedlings will not have been raised in the Central Nursery in time for the planting during 1949–50, required seedlings shall be bought from elsewhere.

372. *Soil working and weeding.*—Soil working and weeding shall be done in August, October and December during the first year of planting.

During the second year of planting, the work should be repeated in June, August, October and December.

While doing the soil working, the weeds shall be pulled to a radius of 1½ feet all round the seedlings.

373. *Pruning*.—In order to allow of free circulation of air which will promote good growth of the plants, the side branches of saplings in the plantation will be pruned up to a height of 4 to 6 feet from the ground in the fifth year. Such pruning will be done in the seventh year also, if found necessary.

374. *Rotation.*—The rotation will be 15 years and at the end of the 15th year the growth will be clear-felled and the area replanted.

375. *Nursery.*—For planting 12 acres annually, at least 25,000 seedlings will be required, including the requirements for replacing casualities. Hence three standard beds of 40′×4′ will be formed in a convenient locality containing sandy loam soil. The nursery beds will be raised by about 9 inches from the ground level. The sides of the beds should be supported with bricks or stones but not with bamboo slats or other poles lest the bamboo slats or poles should attract white ants.

About 8 lb. of good casuarina seed shall be sown in each bed and, after sowing, the seed should be covered with pure sand up to a thickness of about half an inch. The sowing should be done in October. Each bed shall be watered profusely both in the morning and in the evening. The watering should be sprayed by means of rose cans. Any insect attack, if found in the beds, should be promptly reported to the District Forest Officer, who in urgent consultation with the Provincial Silviculturist, will take steps to destroy the insects and to prevent recurrence of similar attacks. Under normal conditions, the germination is expected to be complete in about a fortnight. In about 6 weeks, the seedlings are expected to be about 6 inches in height, when they shall be picked and transplanted in lines 4 inches apart in new beds similarly prepared. Care should be taken not to cause any damage to the plants during the transplanting in the new beds. The new beds should be watered adequately to keep them moist always. It may be necessary to put up pandals, about 3 feet high over the beds during the hot weather.

SECTION 3—OTHER REGULATIONS.

376. *Grazing.*—The plantations shall be closed to grazing for five years including the year of planting.

377. *The litter.*—The litter shall not be allowed to be removed from the forest floor.

378. *Fire protection.*—The outer periphery of the entire planted block will be fire traced by cutting a 15 feet wide line and burning the cut material in the line in January each year.

379. *Control registers.*—A plantation journal shall be maintained in the District Forest Office. No special form is prescribed. Essential information such as the dates on which the various works connected with the operations were done, the cost, the condition of the growth in the plantation from time to time until at least the fifth year and such other information which in the opinion of the District Forest Officer will be useful, shall be recorded in the journal. A surveyed sketch of each plantation should be filed in the plantation journal at the appropriate place at the commencement of the entries for each plantation. The sketch should show all the physical features of the land and should show the particular plantation tied to a known point.

CHAPTER VII—WORKING PLAN FOR THE EXPERIMENTAL TEAK PLANTATION WORKING CIRCLE.

SECTION 1—CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

380. *General.*—The forests on the Hosur Plateau, though primarily contain sandal, would appear to have once supported teak also. This belief is supported by the existence of occasional patch of teak growth in the reserved forests such as for example, Gulhatti Reserved Forest and Manchi Reserved Forest ; in the latter reserved forest, one of the teak trees measures 96 inches in girth though the bole is stunted. Hence the possibility of the teak being one of indigenous and not exotic species in the forests of the Hosur Plateau cannot be overruled.

381. The artificial introduction of teak was first started experimentally over an area of about five acres in 1941 in Gulhatti Reserved Forest. The experiment was repeated in the two succeeding years over five acres in each year in the same reserved forest. These plantations have not been very successful but they cannot be said to be failures. The expenditure incurred over these plantations has been only Rs. 23 on an average per acre for the first three years and, considering the low expenditure incurred in the raising of the plantations, no better results can be expected to be achieved and the condition of the present growth in these plantations in Gulhatti Reserved Forest is perhaps commensurate with the cost incurred. Silvicultural operations appear to have been completely neglected or imperfectly done in these plantations.

382. The experimental plantations mentioned above have shown that teak is not unsuited to the soil conditions on the Hosur Plateau, that it can be grown artificially and that a fair amount of success can be achieved in the artificially raised plantations, if only care is bestowed in the raising of plantations and in the subsequent silvicultural operations in the plantations.

383. The continuance of the experimental regeneration of teak artificially over an area of five acres every year is therefore prescribed. If, during the period of this working plan, the plantations give satisfactory results consistent with the expenditure incurred, similar regeneration will be prescribed on a larger scale in the next revision of the working plan.

384. *Constitution of the working circle.*—An area of 75 acres in Nyamasandiram Agraharam reserved forests has been selected to form the experimental Teak Plantation Working Circle.

385. *Character of vegetation.*—The vegetation in the area constituting the working circle is good deciduous type, comprising of *Bambusa arundinacea, Grewia tiliaefolia, Anogeissus latifolia, Terminalia bellerica, Helia dubia, etc.*, which are the associates of the teak. The soil is sandy loam. The average annual rainfall in the locality varies from 35 inches to 40 inches. The area adjoins the Sameri Cheruvu (tank), which contains water for a major part of the year.

386. *Formation of planting series and annual planting areas.*—The whole working circle of 75 acres will form one planting series. This area is divided into 15 annual planting areas of five acres each for planting from 1949–50.

SECTION 2—METHOD OF TREATMENT.

387. The method of treatment is replacing the existing deciduous jungle growth by artificially introducing teak.

388. *Survey and demarcation.*—The area to be regenerated every year is marked on the map accompanying this working plan and it should be taken up for planting in the sequence shown on the map. The area allotted for planting each year shall be surveyed and demarcated on the ground. At the same time, all sandal trees which will yield heartwood and which may be found in the area, shall be extracted departmentally. Sign-boards showing the year of formation and the area, should be placed at convenient corners of the area. This work shall be completed by the end of December.

389. *Felling the growth.*—All the growth in the area shall be completely felled departmentally before the end of February.

The felled material shall be burnt early in April, care being taken not to allow the fire to escape to the adjoining forest areas. The burning will be carried out under the personal supervision of the Range Officer.

390. *Aligning and staking.*—The whole area shall be aligned and staked at an espacement of 6′× 6′ before the end of April.

391. *Planting.*—The planting shall be done in May or as soon as the south-west monsoon breaks out, whichever is earlier.

392. No nursery need be opened in the division since the teak stumps required will be only about 7,000. The required teak stumps will be obtained from other divisions through the Provincial Silviculturist, who will arrange for the supply.

393. The stumps shall be planted in crow-bar holes at stakes, and in the rains under the personal supervision of the Range Officer.

394. *Replacement of casualties.*—Casualties shall be replaced in July and September in the year of planting. During the second year, casualties shall be replaced in July, if necessary.

395. *Soil working and weeding.*—Weeding shall be done as follows :—

First year—July, September and December.

Second year—July, September and December.

Third year—May.

Soil working shall be done in the first and the second years, along with the weeding, to a radius of not less than one and half feet round each plant.

396. *Tending.*—This work will consist of—

(i) cutting back all the growth interfering with teak ;

(ii) cutting climbers ;

(iii) pruning the epicormic branches ; and

(iv) removing double leaders, if any

and shall be carried out during the fifth year by the end of May.

397. *Thinning.*—The District Forest Officer shall inspect the plantation during the sixth year and decide, with reference to the condition of the stand, whether the plantation should be thinned or not. If a thinning is decided on, it shall be mechanical thinning and shall be carried out under the personal supervision of the Range Officer. A second thinning in the tenth year, if called for, will also be done.

If a third thinning in the fifteenth year, is considered necessary, it shall be a silvicultural thinning.

398. *Rotation.*—It is too early to prescribe anything about rotation. It will be fixed at the revision of the working plan by which time the plantations prescribed in this working plan will have given some idea for fixing it.

SECTION 3—OTHER REGULATIONS.

399. *Grazing.*—The plantations shall be closed to grazing for six years, including the year of formation.

Cutting of grass may, however, be allowed in the plantations from the third year.

400. *Fire protection.*—The outer periphery of the planted areas shall be fire-traced to a width of fifteen feet before the end of January each year.

401. *Control registers.*—A plantation journal shall be maintained for each plantation, in which shall be entered from time to time the particulars of the dates on which the various operations have been carried out, expenditure incurred for each item of work and the result. If a particular item of work is not carried out at all or not carried out by the time prescribed in the working plan, full reasons shall be recorded as to why the work was not done as prescribed. Information such as the climatic variations obtaining in the locality, rainfall, etc., which has direct bearing on the plantation work shall also be recorded in the journal from time to time.

402. As the plantations are to be raised as an experimental measure, it is of utmost importance that the District Forest Officer shall inspect the plantations frequently and record his own observations then and there.

403. A surveyed sketch of each plantation showing the adjoining land marks shall be filed in the plantation register.

CHAPTER VIII—WORKING PLAN FOR EXPERIMENTAL SOFTWOOD PLANTATION WORKING CIRCLE.

SECTION 1—CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

404. *General.*—The Government have impressed on the need for increasing the output of softwood timber in the reserved forests, as the demand for such timber has assumed large proportions for industries such as matchwood, plywood, catamarams, etc. Inspection of the reserved forests in North Salem division shows that the softwood timber species such as *Melia composita* and *Ailanthus excelsa* occur in most of the reserved forests though neither gregariously nor in concentrated patches. There is however a good prospect of raising plantations of the above species in suitable localities. But as we know so little about raising softwood timber species artificially, it is advisable to raise plantations of the softwood species on a small scale experimentally, to start with, and if the results are satisfactory, plantations can be raised on large scale later on.

405. *Constitution of the working circle.*—An area of 30 acres has been selected in Noganur reserved forest (Denkanikota West Range) to form the working circle.

406. *Character of the vegetation.*—The vegetation on the area selected for the working circle is of deciduous type and contains species such as *Acacia lencophlœa, Terminalia bellerica, Albizzia amara, Albizzia lebbek,* etc. The soil is sandy loam and the annual rainfall is about 35 inches. Hence this locality is considered favourable for raising *Melia composita* and *Ailanthus excelsa* plantations.

407. *Division of the working circle into plantation series and annual planting area.*—The whole working circle of 30 acres will form one plantation series, which is divided into, 15 annual planting areas of two acres each. The planting work shall commence from 1949–50 in the sequence indicated in the map accompanying this working plan.

SECTION 2—METHOD OF TREATMENT.

408. The method of treatment adopted for the working circle is to replace the existing miscellaneous deciduous species by a mixed growth of *Melia composita* and *Ailanthus excelsa* species.

409. *Survey and demarcation.*—The area allotted for planting each year shall be surveyed and demarcated on the ground. At the same time, all sandal trees which will yield heartwood and which may be found in the area, shall be extracted departmentally. Sign boards showing the year of formation and area, should be placed at convenient corners of the area. This work shall be completed by the end of December.

410. *Felling the growth.*—The tree growth on the area shall be sold in public auction as bidders will be available due to the proximity of the area to Denkanikota village. The successful bidder shall be required to complete the felling, remove the fuel and hand back the area to the department by the end of March. The brushwood and slash shall not be permitted to be removed by the contractor but shall be left in the area for being burnt for regeneration operations.

411. If no contractor is forthcoming to buy the tree growth, the trees shall be felled departmentally and the fuel sold in auction.

412. *Burning.*—After the contractor shall have handed back the felled area to the department, the residual growth in the area shall be cut back departmentally. The brushwood and slash shall then be heaped and burnt in April, taking care to see that fire does not spread to the adjoining forests. The burning will be carried out under the personal supervision of the Range Officer.

413. *Aligning and staking.*—The whole area shall be aligned and staked at an espacement of 9′×9′ before the end of April.

414. *Planting.*—On the question of suitable season for planting the softwood species, the Provincial Silviculturist is of opinion that *Ailanthus excelsa* may be planted in June and *Melia composita* in October and November. Inasmuch as the proposed experimental plantations are to contain *Melia composita* and *Ailanthus excelsa* together, it is proposed to do planting of both the species in June. The progress of growth of *Melia dubia* seedlings shall be carefully watched to notice the effect of early planting.

415. Seedlings of *Melia composita* and of *Ailanthus excelsa* shall be planted in crowbar holes at stakes. The proportion of the species will be half and half and each species will be planted alternately. The planting shall be done in rains. The seedlings will be obtained from nursery raised for the purpose.

Section 3—Nursery Operations.

416. *Seed collection.*—The *Melia composita* fruits in February and March and *Ailanthus excelsa*, in April and May. The seed of *Melia composita* falls from the tree in the form of fruit and *Ailanthus excelsa* tree drops seeds straightaway. The fruits of *Melia composita* shall be gathered, pounded in wooden mortar and seeds secured.

Care shall be taken to store the *Ailanthus excelsa* seeds in insect-proof receptacles, as the seed of this species is susceptible to insect-attack. *Melia composita* seeds are insect-proof by themselves.

417. *Treatment of seeds for sowing—Ailanthus seed.*—The seed shall be put in cold water and kept in it for 24 hours before sowing. No such treatment is called for in respect of *Melia composita* seeds.

418. *Sowing seeds.*—Seeds of *Melia composita* and *Ailanthus excelsa* shall be sown in separate seed beds of standard size.

The *Melia* seed shall be sown in March. The seeds will be sown in the bed and, after sowing, the seeds shall be covered with three-inch thick layer of litter and burnt. Immediately after the burn, the seeds shall be covered with a layer of three to four inches thickness of loose earth and the whole bed watered liberally. In dry season, pandals may be put up over the bed to preserve moisture.

Seeds of *Ailanthus excelsa* shall be sown in May-June in raised beds. After sowing, the seeds shall be covered lightly with straw or grass and the bed watered liberally.

All the above operations shall be carried out under the personal supervision of the Range Officer.

The seed beds shall be regularly weeded to keep them free of weeds at all times.

Note.—As seedlings raised with reference to above prescriptions will be available for planting only in the following year. The seedlings required for the area due for planting in 1949-50 will be obtained by the Range Officer, Denkanikota West, from the compound of the Range Officer's quarters.

Section 4—Other Regulations.

419. *Grazing.*—The planted area shall be closed to grazing for ten years including the year of planting.

420. *Fire protection.*—The outer periphery of the planted area shall be fire-traced to a width of fifteen feet before the end of January each year.

421. *Replacing casualties.*—Casualties shall be replaced from time to time, as and when they occur, till October. If, in the second year, void is still found due to any cause, the casualties may be replaced in June of the second year also, so as to ensure full stocking.

422. *Weeding and soil working.*—Clear weeding by cutting back all weeds in the area shall be done during the following months :—

First year—July, September and December.

Second year—May and September.

At the same time as weeding, soil working around each plant to a radius of at least one and half feet shall be done.

423. *Tending.*—All climbers and other growth interfering with the main species shall be cut during the third and fourth year. Climber cutting after the fourth year shall be decided by the District Forest Officer after inspection by him of the plantation.

424. *Thinning.*—The need for thinning the plantation shall be decided by the District Forest Officer in the fifth year after inspection by him of the plantation.

425. *Rotation.*—The fixing of rotation shall be considered at the next revision of the working plan with reference to the condition of the stand.

426. *Control registers.*—A plantation journal for each plantation and a nursery journal shall be maintained in the District Forest Office.

Instructions about the writing up of the plantation journals prescribed in paragraph 401 of Chapter VII will, *mutatis mutandis* apply to the maintenance of the plantation and nursery journals under this paragraph.

CHAPTER IX—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

Section 1—Constitution of the Working Circle.

427. The grazing working circle comprises all the reserved forests in the division. Grazing will be allowed, subject to the conditions prescribed herein below, in all the reserved forests, except in the localities expressly excluded from grazing for specified periods, for silvicultural reasons, under the prescriptions of this working plan.

428. Goats shall not be permitted into the reserved forests.

429. The total area of the reserved forests excluding such of the regeneration areas as are temporarily closed to grazing, will be 451,968 acres. The cattle population in the division can be estimated at 114,400 cow units approximately. It can therefore be estimated that the reserved forests of the division afford a nominal possibility of grazing incidence at the rate of four acres per cow unit.

SECTION 2—SYSTEM OF GRAZING.

430. The systems of grazing under this working plan shall be—

(i) ordinary system of grazing regulated by licensing cattle ; and

(ii) special system of grazing known as the " Rotational grazing system " in selected localities within reserved forests.

(i) *The Ordinary System of Grazing.*

Under this system, all cattle shall be licensed to graze in the reserved forests on payment of the prescribed fees at the following rates :—

Cows or bulls	As. 4 per head.
Buffaloes	As. 6 ,,
Sheep	As. 2 ,,

The grazing permit issued in a particular range will be valid throughout the division. Cattle may be penned at specified localities within the reserved forests at the following rates :—

(*a*) For cattle penned within the range to which they belong.	Re. 1 per 100 heads of cattle.
(*b*) For cattle belonging to one range but penned in another range	Rs. 1-8-0 per 100 heads of cattle.

Penning licenses issued for a particular range shall be valid only for that range.

(ii) *Rotational Grazing System.*

431. *General.*—As part of the general policy involved in the pasture management, Mr. C. R. Ranganathan discussed at length (in paragraph 348 to 353 of the last working plan) about the need for improving the carrying capacity of the localities usually subjected to grazing. In the course of the discussion, he stated :

" Recent researches in pasture management have indicated a method of improvement grazing, which does not involve any outlay of capital and which can be applied to forest conditions without serious difficulty. This new method is called *Rotational grazing.* The principle of rotation consists in moving a limited number of cattle from block to block within an allotted area at short intervals. This system of pasture management was developed in Germany during the war and it has since been tested and adopted by several other countries.

" According to McConkey (*recent advances in pasture management,* by O. McConkey, published by the Empire Marketing Board, July 1931), rotational grazing is applicable to areas of low rainfall. He says that ' in areas of low rainfall, the indigenous grasses depend on reseeding to a great extent to maintain themselves in competition with other species of uneconomic plants ; this is in contrast to the vegetation of humid areas which relies on vegetative reproduction to a great extent, long creeping stems, stolons, etc. Heavy grazing is essential on this type of pasture to ensure maximum nutritive returns ; not so in the dry areas of the Empire where the natural climax cover is an open " bunch grass " formation which, when overgrazed and no provision for rotation and rest period are used in the management rapidly deteriorates to a surface bare of valuable pasture grasses, and is quickly invaded by moss, sagebrush, cacti and hard xerophytic plants of low pasture value.' An interesting experiment in the improvement of forest grassland in the Bombay, Deccan, was carried out by Dr. W. Burns, Economic Botanist to the Government of Bombay, and the results are published in the *Indian Forester* (Volume LVII, 1931, pages 601–609). His conclusions are :—

(i) The best way to make full use of grass land is to take advantage of the gregarious habit of cattle and graze a large herd in one restricted place rather allow them to wander at will over a big area. Where fencing is impossible, such restriction will have to be done by herdsmen.

(ii) For such lands as were dealt with in the experiment (which are similar to the forests of the working plans area), one animal to two acres seems about right. This ratio applies to the whole rotation system and not the sub-blocks grazed over periodically. The actual density in the sub-block occupied by the cattle will, of course, be this ratio multiplied by the number of sub-blocks in the rotation system.

(iii) In practice, the blocks will obviously have to be large, i.e., hundreds instead of tens of acres.

(iv) In practice, the length of the time that any sub-block shall be grazed will have to be arbitrarily fixed. This period will have to be determined by experience. One can only say that in the first instance it will probably be wise to err on the side of too short rather than too long an occupation of the ground.

" Dr. Burns found that continuous grazing by even a small number of cattle is far more damaging to vegetation than grazing for shorter discontinuous periods by a large number of cattle. The adoption of rotational grazing resulted in his experiment in an increase in the carrying capacity of the locality, and in the improvement of the quality of both the grass complex and the tree crop.

" The principle of rotation has been tested from several points of view. Experiments at Aberstwyth, at Cambridge and in Finland under controlled conditions have shown that under rotational grazing (i) the live weight of the grazing stock is increased, (ii) the amount of cut fodder per acre progressively increases as the period of rotation rises from one to three weeks. (See McConkey's pamphlet cited above.) The shorter the interval of rest, the less pronounced were benefits of rotation found to be.

" These striking results provide a strong case for the introduction of rotational grazing in our forests. The method involves (*a*) restriction of the number of cattle grazing over a given area, (*b*) the allotment of a definite area for grazing by the prescribed number of cattle, and (*c*) the alternation of the stock from paddock to paddock in strict accordance with a pre-determined time-table. The closure of specified paddocks to grazing and the limitation of the numbers of cattle permitted to graze within the rotation system are in apparent (but not real) conflict with the grazing policy of Government. It would be a mistake to suppose that the adoption of rotational grazing is in effect merely the revival of the now abandoned block system of grazing. It is not intended to confine the cattle of particular village to a particular grazing ground, nor is it intended, to portion out the available pasture among the various villages. Rigid control over the number and movement of the cattle is of course inherent in the new system, but such control is primarily in the interests of the cattle and is inevitable in any measure calculated to improve pasture or livestock. To begin with, the restrictions will no doubt have to be imposed officially and will be resented by the graziers, but if the advantages claimed for rotational grazing are realized in large-scale practice, we may naturally expect the graziers to submit willingly to, and even apply voluntarily, the necessary regulation.

" In any event, the system deserves to be tested fully under practical field conditions. The obvious places for carrying out the proposed experiments are pens. The District Forest Officer has the power to fix the number of cattle that may be admitted to any pen. One essential condition of success is thus readily realized. Moreover, since the same cattle are stalled in a pen for prolonged periods, control over their movements is easily exercised, and observation of their condition easily made. Finally, in pens a positive inducement to submit to the regulations of rotational grazing can be given by reducing or waiving the penning fees in the pens selected for the experiment. The system has not yet been tried under forest conditions on a large scale and we consider it safer, and administratively more convenient, to limit the experiment in rotational grazing to two selected pens in the first instance. When the experiment is proved to be a success, and the ryots are convinced of its advantages, it will not be difficult to extend it to other pens and even to the case of day-to-day grazing in the forests."

432. With reference to the suggestions contained in the last working plan, " Rotational " grazing system in two selected blocks of 4,870 acres in the aggregate Natrapalayam and Woddapatti reserved forests was introduced, as an experimental measure from 1937. As the system worked satisfactorily, it was continued with 3 additional blocks of 1,778 acres in the aggregate opened in Parigam B and Sanamavu reserved forests, with effect from 1941.

433. In the meantime, the recommendations of the Special Officer for grazing (Mr. J. A. Wilson) were ordered to be given effect to.

434. The main features of the Special Officer's suggestions were—

(i) Classification of the reserved forests as " Major " and " Minor ", the " Major " class being the interior reserves to which cattle do not usually resort for grazing ; and the " Minor " class being those which are nearer the villages ;

(ii) classification of cattle as " essential " and " non-essential ", the " essential " cattle being those which are kept by the ryots for agricultural and domestic purposes such as draught and plough bulls, milch cows etc. ; and the " non-essential " cattle being those which are kept for commercial purposes ; and

(iii) the introduction of the " Rotational grazing " system in—

(a) blocks in which penning was provided ; and

(b) blocks in which no penning was provided.

Each block was to be divided into 3 " paddocks ". The Rotational grazing blocks in the " Major " class of reserves were to provide for penning whereas those blocks in the " Minor " class of reserves were to provide no penning.

435. No new rotation grazing blocks were opened during the war years. But, the Rotational Grazing System already introduced in the division in the seven blocks mentioned in paragraph 432 was continued. Inspection of these blocks has shown that the system worked satisfactorily. It is, therefore, considered desirable to prescribe in this working plan for more Rotational Grazing Blocks.

436. The " Rotational Grazing " blocks shall be opened in the following " Minor " and " Major " classes of forests :—

Serial number and Range.	*Reserved forest.*	*Name of the block.*	*Area.*	*Carrying capacity at 3 acres per cow unit.*	*Paddock and area.* I	II	III	*Remarks.*
			ACS.	COW. UNIT.	ACS.	ACS.	ACS.	
		Minor Forests.						
1 Denkanikota west.	Sanamavu ..	Sanamavu	447	179	133	159	156	The villages are within two miles of the reserve and cattle can return to the villages.
Do.	Do.	Perandapalli ..	561	244	186	189	189	Water avialable in Pennar.
2 Dharmapuri ..	Parigam B. ..	Ayyankuttai ..	540	216	180	180	180	Cattle return to villages.
Do. ..	Do. ..	Isalapatti ..	791	316	272	272	247	Do.
Do. ..	Do. ..	Thappuvu ..	500	200	150	150	200	Do.
Do. ..	Do. ..	Kombai ..	705	282	235	236	234	Do.
Do. ..	Badanavadi ..	Eriyoor ..	721	288	241	240	240	A perennial stream runs through the block.
Do. ..	Do. ..	Thanda ..	715	286	237	240	238	Do.
3 Krishnagiri ..	Nandibanda ..	Nandibanda ..	363	145	120	121	122	Cattle return to villages.
		Major Forests.						
4 Anchetty ..	Anchetty ..	Gollamathi ..	2,280	760	660	800	820	Kathripallam contains water for six months.
Do. ..	Hiligundlu ..	Kallamadagu.	2,700	900	960	940	800	Kallamadaguhalla contains water for eight months.
Do. ..	Taggatti ..	Devamathi ..	2,200	733	720	620	800	Water will be available for two months. A well is to be provided for this block.
Do. ..	Bilikal ..	Kadathur ..	3,434	1,145	1,280	1,258	896	Water in Balagadahalla will be available for six months.
Do. ..	Kestur ..	Dabbakalli ..	1,930	643	680	450	800	Water in Cauvery will be available throughout the year.
Do. ..	Makahalli ..	Udupatti ..	2,400	800	840	720	840	Do.
Do. ..	Natrapalayam.	Padugatti ..	1,730	577	800	500	430	Do.
Do. ..	Woddapatti ..	Mosalamadugu.	3,140	1,047	990	930	1,220	Do.
Do. ..	Ubrani ..	Gundalam ..	1,725	575	560	525	640	Water will be available in Gundalam well.
5 Dharmapuri ..	Kosarguli ..	Pallamadavu ..	3,380	1,127	1,100	1,280	1,000	Water will be available in Chinnar river.
Do. ..	Morappur ..	Budipatti ..	2,710	903	900	850	960	Do.
Do. ..	Do. ..	Honaimarathu-patti.	2,125	708	650	700	775	Water will be available in a tributary of the Chinnar.
Do. ..	Bevanurmalai.	Gudupatti ..	1,795	598	725	450	620	Water will be available in Cauvery river.
Do. ..	Badanavadi ..	Konganapatti.	1,975	658	575	750	650	Do.
Do. ..	Do. ..	Emanvu ..	2,190	730	850	640	700	Do.

437. The Blocks, the Paddocks and the Pens are marked on the maps accompanying this working plan.

438. The Rotational Grazing System in the "major" class of forests shall not be introduced in all the blocks all at once. It will be introduced in two blocks each year. On the other hand the system shall be introduced in all the blocks in the "minor" class of forests simultaneously in 1950–51.

439. In view of the practical difficulty involved in classifying the cattle into "Essential and Non-essential", no such classification will be attempted at. All cattle will be treated alike for purposes of grazing.

440. The following rates of grazing fees shall be charged for cattle resorting to the Rotational Grazing Blocks :—

Six annas per cow unit for grazing blocks in "minor" class of forests.

The usual grazing fee of four annas per cow unit for grazing blocks in "major" class of forests plus penning fee at rates mentioned in paragraph 430.

441. As the formation and maintenance of the Rotational Grazing Blocks will involve extra expenditure to Government, it would be desirable to increase the above rates. But such an increase at the present juncture is likely to involve the risk of the Rotational Grazing System not gaining the popularity which is aimed at. However, this aspect will be considered at the end of five years, when the District Forest Officer will make a special report to the Chief Conservator through the Conservator.

Section 3—Regulations of Grazing in the Rotational Blocks.

442. The statement furnished in paragraph 436 contains particulars of paddocks in each block. The blocks of the year and the paddocks in them shall be demarcated in the first instance with fifteen feet wide lines, but wherever possible natural features will be adopted for such lines. Rough stone cairns will be put up at perceptible intervals along the paddock lines. All lines shall be properly maintained. It is essential that the limits of the rotational blocks should be clearly identifiable by graziers.

443. The grazing year shall be from 1st July to 30th June.

444. The paddocks in each block shall be open to grazing in rotation, beginning from Paddock No. I. Cattle will be permitted to graze in one paddock at a time for a period of one month only and on the expiry of the one-month grazing, it shall be closed to grazing for the subsequent two months, allowing the cattle to graze in the next paddock in sequence, similarly for a month period, and so on.

445. If, in any paddock, the grass is not sufficient enough to sustain the grazing for the prescribed period of one month at a time, the next paddock in sequence in the block, shall be opened for grazing, provided the new paddock, so opened, had remained closed to grazing at least for a period of six weeks previously. Such a step shall not be taken except after personal inspection of the Range Officer and on the previous approval in writing of the District Forest Officer.

446. The permissible grazing incidence applicable to each paddock shall be three acres per cow unit.

447. Consistent with principle that each paddock shall be given rest for two months and with reference to the local conditions obtaining in each block, the District Forest Officer shall, by issue of suitable administrative instructions to the subordinates charged with the duty of regulating the grazing, see that the subordinates are not unduly harsh towards graziers for any technical petty delinquencies, as, otherwise, the advantage accruing from the Rotational Grazing System is apt to be jeopardised.

Section 4—Other Regulations.

448. *Pens.*—The pen-site in each paddock will be divided into two, more or less equal compartments so that the cattle may be stalled in each compartment alternately for fifteen days. This course is suggested from sanitary point of view.

449. The graziers will be allowed free to collect the materials required for putting up sheds in the pens and for fencing the pen-compartments.

450. *Improvement to water facilities.*—The existing water sources in the pens shall be improved and new water facilities provided, where required, according to the following statement :—

Name of pen.	*Name of reserved forest.*	*Capacity of pen.*	*Period of penning.*	*Improvements suggested.*	*Probable cost.*	*Year in which the improvement may be carried out.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
		COW UNITS.				
Yelandamaram	Tholavubetta.	700	August to December.	A masonary dam across the Tholavubetta stream to be put up.	300	1950–51.
Neelamandoddi	Kempakarai	1,500	Do.	Do.	300	1952–53.
Kagaleri	Guttirayan	800	Do.	The tank close to the pen to be depened.	250	1952–53.
Budipatti	Morappur	1,100	Do.	The well to be deepened and improved.	200	1953–54.
Hanumanpatti	Do.	1,200	Do.	A masonary dam across the stream to be put up.	150	1951–52.
Gandalam	Ubrani	1,300	May to January	A well on the bank of Doddahalla to be dug.	300	1950–51.
Kallumaduvu	Billigundlu	1,100	June to January	A dam across the Basavanathamhalla to be put up.	200	1951–52.
Gollamathi	Anchetti	900	May to January	A dam across the Kadirihalla to be put up.	300	1954–55.
Chinnaoothu	Do.	450	May to February	Improvement of the existing well on the Anaibiddahalla road near the 19th mile 1st furlong.	200	1955–56.
Kadathur	Bilikal	500	Do.	A dam across the stream and deepening the stream bed.	300	1956–57.
Shenbagamhalla	Taggatti	700	Do.	Widening and deepening the existing well on the stream bed.	300	1957–58.
Tatakan	Bilikal	300	Do.	Improvement of the existing well	300	1958–59.
Hoggurdoddi	Taggatti	600	Do.	Construction of a well on the stream bank.	300	1959–60.
Emmahalli	Kestur	600	Do.	Deepening the existing tank and building revetment.	300	1960–61.
Sambalnatham	Do.	600	Do.	A dam across the stream to be put up.	300	1961–62.
Osahallinatham	Bilikal	500	Throughout the year.	Deepening the existing well	100	1955–56.

451. *Cutting and removal of fodder grass.*—The villagers will be allowed the cutting and removal of fodder grass on head-loads free of charge from the reserved forests.

452. *Control.*—A journal for each Rotational Grazing block shall be maintained in the District Forest Office. Information regarding the nature of growth of grass in the block at the commencement of the grazing year, the number of cattle working from paddock to paddock, villagewar details block and any other information which will be useful in the pasture management under the Rotational Grazing System shall be recorded in the journal from time to time.

CHAPTER X—WORKING PLAN FOR THE LAC WORKING CIRCLE.

SECTION 1—CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

453. *General.*—The last working plan prescribed the Lac Working Circle to include all areas in reserved forests (and certain small areas in unreserves) on the Hosur Plateau, where the Lac-host *Shorea talura* occurs. The cultivation of the Lac on *Shorea talura* was carried out till 1943–44. But, as brood-lac for infecting the *Shorea talura* trees could not be procured, the cultivation of Shorea lac was deferred from 1944–45 onwards.

454. Though the last working plan prescribed the cultivation of lac on *Shorea talura* only, Kusum lac was also cultivated on *Schliechera trijuga* and *Zizyphus jujuba*. The quantities of both kinds of lac cultivated in North Salem division from 1935 to 1943 were—

Year.	*Shorea lac.*	*Kusum lac.*
	LB.	LB.
1935	13,524	8,693
1936	17,152	7,767
1937	7,175	2,637
1938	8,495	1,804
1939	6,351	6,452
1940	955	8,961
1941	77	3,032
1942	566	3,141
1943	827	9,452

455. As the supply of brood from Madurai Division for Kusum lac was ensured, Kusum lac was continued to be cultivated in the division under a scheme prepared by Mr. E. A. Lasrado and approved by the Conservator in 1941. The scheme provided for the cultivation of lac in forests situated in lower elevations also. But, it has been found that the operation has not been successful in such localities.

456. Hence, it is proposed to cultivate Kusum lac on a limited scale in the forests only on the Hosur Plateau, under this working plan.

457. *Constitution of the Working Circle.*—The Lac Working Circle comprises of selected blocks containing *Schliechera trijuga* and *Zizyphus jujuba* trees in Aiyur, Gulhatti and Tholavubetta reserved forests.

458. *Division of the Working Circle into cultivation series.*—There shall be two cultivation series in the Working Circle as follows :—

Name of series.	Name of reserved forests.	Species of lac-host.
Gulhatti	Gulhatti reserved forest ..	*Zizyphus jujuba.*
	Aiyur reserved forest ..	Do.
Tholavubetta	Tholavubetta	*Schliechera trijuga.*

459. The growth of shoots from pruned branches take different periods in the two species of the host trees and the condition required for infection also differs in them. Thus *Schliechera trijuga* takes about $1\frac{1}{2}$ years to throw out shoots fit for infection but no pruning need be done in the first instance for infection of brood-lac.

460. On the other hand *Zizyphus jujuba* takes only six months to throw out shoots and its branch needs to be pruned even for the first infection. After one crop, which will be of about six months period, it needs rest for one year before it is pruned again, with a view to enable it to give suitable shoots for the next crop season. Taking into consideration the above silvicultural aspects and with a view to carry out the cultivation operations on a uniform basis in respect of both the species, each series have been divided into four infection groups. The first two infection groups in each of the series will be taken up for cultivation in 1950–51 and the remaining two groups in 1951–52 and this sequence shall be repeated so as to meet the silvicultural needs and treatment of the two species.

Section 2—Method of Cultivation.

461. *Lac and the lac insect.*—Lac is the resinous incrustation secreted by lac insects as a protective covering against weather and against natural enemies. Several kinds of products are made out of lac, such as polish, varnish, sealing wax, gramophone records, dyeing ingredients and other kindred articles of commercial value.

462. That species of lac insects which is cultivated on *Schliechera trijuga* and *Zizyphus jujuba* is known as *Laccifer lacca* (Kerr). The new born insects or larvae are minute in size and red in colour.

463. On emergence from the parent cell, the larvae crawl over the shoots of the tree on which they are cultivated, and, when they have found a suitable place they settle down and drive their slender probasces into the bark of the tree and start feeding on the sap.

464. The larvae prefer to settle down on the under-side of horizontal twigs, and all round the stem on vertical shoots. They colonise in very large numbers, often completely covering the twigs, each larva touching, or at least being very close to, its neighbour. Once settled, the larvae never move again. In a few days of its settlement, a thin shiny film covers the body of the larva. This film is called ‘ lac ’ and it grows thicker with the growth of the insect. The lac secretion from one insect soon coalesces with that of its neighbour and forms a continuous coat, which is called “ encrustation.”

465. The larvae are of two kinds, male and female and the presence of both go to form, what is called the “ brood.” The male larvae are usually less numerous than the female larvae.

466. As each larva grows, it encloses itself in a cell called the “ testa ”. The testa of the male larva is thin and cigar-shaped while that of the female larva is larger and more or less oval. Each testa contains three openings, two of which are called “ brachial ” or breathing pores and the third, the “ anal cleft ” or opening. The testa of the male larva has, in addition, a circular opening covered by a circular lid called the “ operculum ” through which it emerges on maturity.

467. Through these openings, the lac insects, both male and female, eject white waxy filaments. The healthier the brood, the more profuse is the ejection of the filaments, which give the encrustation a cotton-woolly appearance.

468. Through the anal cleft, a sweet sticky secretion is excreted. This secretion is called the " honey dew ". The honey dew attracts ants. It drips or is washed down by rain on the leaves below and forming the food material of a black fungus, which spreads on the upper surface of the leaves and gives them a black coating. The presence of the black coating in quantity is an indication of a healthy crop of lac. The fungus is harmless.

469. *Infection (or inoculation) of brood lac*.—Points of infection in each branch and tree shall be selected with care. The infection shall be done with " bundles " of brood lac at the selected points. The amount of brood-lac to be tied at each point shall be determined by Range Officer having regard to the condition of the shoot concerned.

470. *Removal of the stick lac*.—The larvae continue to come out for four weeks, but generally swarm in large numbers during the first fortnight, if the weather continues to be bright and normal. The brood-lac should be allowed to remain on the trees during the period when swarming is brisk, i.e., 12 to 15 days, and then removed even though some larvae still continue to emerge. The reason for doing this is that the great majority of the lac larvae would have emerged in this period, while quite a number of its enemies would not have emerged. It is very important to make sure that all the brood-lac put on each tree is removed and that nothing is missed out and left to remain on the tree or lie on the ground.

471. *Male swarming*.—The male and female larvae settled on the shoots go on developing side by side and become adults in about 6 to 8 weeks, at the end of which period they emerge out of their cells by pushing open the lid situated at one end. This is called male emergence or swarming. These male insects look like the larvae but are slightly bigger and may or may not have wings. They walk over the encrustation and fertilize the females through the anal opening. As the male insect does not feed after coming out of the cell it dies of exhaustion after fertilizing many females in two or three days.

472. The male secretes very little lac ; excess of males in a crop is therefore detrimental to the yield. The females, after impregnation devour more sap for their own growth as well as for that of the large brood developing in their ovaries. Most of the lac is secreted at this stage. The lac encrustation becomes a thick coating, partly or completely enveloping the twigs.

473. *Crop cutting*.—When the crop matures, cracks appear on the encrustation which takes a drier appearance about two weeks before swarming. A yellow-orange spot may also be seen on the female cells. The appearance of these spots indicates the full maturity of the crop, and serves as a means of forecasting the date of the swarming which generally commences about a week or ten days later.

474. These signs of impending swarming should be carefully watched for, and the crop should be cut just sufficiently long before swarming to allow time for cutting and tying the brood-lac on to fresh trees before the swarming starts.

475. *Yield*.—The yield will vary from crop to crop, as it depends chiefly on weather conditions, such as temperature, rainfall and humidity during the crop, as well as on the degree of damage done by enemies of the lac insects, and on the correct pruning and use of the host. The monsoon crop generally yields the best harvest and the post-monsoon crop, the poorest.

476. *Scraping, washing and storing of lac*.—Brood-lac not required for inoculation and stick lac removed from the infected trees, which cannot be disposed of immediately, should not be stored as they tend to block and to breed out moths, but should be scraped and washed. The lac encrustation will come off if beaten with wooden hammers and scraped with knives. The scraped lac should never be exposed to the sun as it will melt and become blocky. It should be ground in stone grinders to a uniform size so as to pass through a sieve. It is then soaked in water for 10 or 12 hours and washed in tubs ; the washed grain lac should be of a uniform colour. It should be thoroughly dried in the shade and cleaned of bits of wood and stones. It should be weighed and stored in an open deal-wood box, turned over at intervals and kept in a cool airy place.

477. The washed lac shall be handed over from time to time to the Research Ranger at Denkanikota, who is charged with the manufacture of the various lac products.

478. *Preparation of the host trees*.—All the branches of the host trees shall be pruned. If the larvae, on emergence fix themselves to a shoot, the bark of which is too thick and corky or too tender, most of them will perish as they cannot move elsewhere to settle down to obtain sap. It is, therefore, essential to produce shoots of uniform suitability.

479. The following instructions shall be observed in carrying out the pruning operations :—

(i) Pruning should not reduce the size of frame of the tree. The maximum diameter of the branch to be cut should not exceed one and a half inches.

(ii) Branches should generally be cut above the forks.

(iii) All horizontal branches should be cut as near their ends as possible.

(iv) If a branch is thinner, it should be cut near the main shoot.

(v) All dead and diseased branches should be completely removed.

(vi) Trees should be entirely pruned.

480. *Life cycle of lac insects.*—It takes about 13 to 14 months for the lac insects to complete three life cycles. Each life cycle of the insects represents one crop season. These life cycles are classed as follows :—

(i) The pre-monsoon cycle ; the crop takes about 15 weeks to mature.

(ii) The monsoon cycle ; the crop takes about 19 weeks to mature.

(iii) The post-monsoon cycle ; the crop takes about 23 to 25 weeks to mature.

Section 3—Other Regulations.

481. *Enemies of lac.*—Lac has a large number of enemies which cause very considerable damage to lac crops. The annual loss is enormous ; on an average nearly two-thirds of the potential crop is destroyed annually. Sometimes the whole crop is damaged and is completely lost.

(*a*) *Eubelmma and Holcocera.*—The most important and injurious of the enemies of lac are themselves insects, the predators and the parasites of lac. Among the predators there are two insects of special importance ; these are *Eubelmma amabilis* and *Holcocera Pulvera.* Each of these is a moth whose larval and pupal stages are connected with lac.

The moth lays its eggs beside a lac cell or on the encrustation. The larva which hatches out eats its way into the encrustation until it gets entirely concealed. It feeds on the lac insect and on the encrustation as it goes on making a tunnel inside the encrustation. When it becomes full-grown it pupates, and the pupa lies in its larval passage. The moth emerges and flies away.

The larvae of *Holcocera* are dark coloured and are very active, while those of *Eubelmma* look creamy white and are fairly inactive. The pupae of both are deep brown in colour, those of *Eubelmma* being slightly yellowish at the abdomen. As far as is known at present the two moths have six cycles in a year, and the *Holcocera* generations correspond approximately with those of *Eublemma.*

(*b*) *Chrysopa.*—Another predator, of minor importance, is *Chrysopa.* The adult is a green fly with golden eyes and transparent wings which are net-veined. Its larva crawls over the encrustation and feeds by pushing its long mouth parts into the body of the lac insect through the openings in the cell. The larva conceals itself by covering its back with bits of leaves and the white filaments of lac, which are held in position by its hooked hairs. It pupates in a small circular cocoon and finally the fly emerges.

(*c*) *Parasites.*—The parasites are very small insects not easily detected by the eye. They make their attack from the inside of the lac cell. Their females lay eggs on or in the body of the lac insect through the anal hole of the lac cell. The larvae hatch out and feed on the lac insect, either living on its surface or actually within its body. The parasites are mostly *chalcides*—black, yellow and spotted and—*Braconides* which have not yet been fully studied.

(*d*) *Damage by rats.*—Rats have been observed to bite off the encrustation on the shoots. They do not eat it. The use of rat-traps to check this damage is recommended. A rat trap costs about a rupee and can be used for a number of years. This method is much safer, simpler and ultimately less costly than the tying of thorns round the holes of trees or the use of poison (Barium carbonate).

(*e*) *Friend of Lac.*—On most lac bearing branches numbers of ants will be seen walking over the encrustation. The majority of them are harmless and some even beneficial. The ants visit lac in order to lick up the " honey dew " secreted by the lac insect. Certain ants attack and kill the larvae of *Eubelmma* and *Holcocera* and these are definitely lac friends. But there are some ants which at the time of swarming or male emergence pick up the crawling larvae or the male insects in their jaws and carry them away. The red forest ant does not belong to this class.

Ants as a whole can be classed as lac friends ; where ants are found to pick up lac larvae or male insects a simple control may be used. The foot of the infected tree may be painted with cheap molasses at the time of larval or male emergence.

482. *Cleaning the tree sites.*—Lantana and other growth under the tree to be infected shall be removed and branches of other adjoining trees interfering with the crown of the host tree shall be cut. This work shall be completed at least one month before the infection is done.

483. *Fire protection.*—The woody branches resulting from pruning the host trees shall be collected and removed in order to minimise the risk of fire.

484. All operations connected with the cultivation of lac shall be personally supervised by the Range Officer.

485. *Control Registers.*—A journal for each cultivation series shall be maintained in the District Forest Office. In it shall be recorded from time to time particulars such as the number of trees pruned, the time of pruning, dates of infection, quantity of brood-lac infected, the period of swarming, *dates of removal of sticklac*, cutting of the crop, yield, extent of damage caused by predators, measures taken to prevent damage and such other essential information as will have a bearing on the lac cultivation.

The cost of operation for each series shall also be recorded.

CHAPTER XI—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND ITS SCOPE.

486. *Constitution of the Working Circle.*—The Minor Forest Produce Working Circle includes all the reserved forests and unreserves in the division.

487. The area of the working circle so far as it relates to reserved forests is (nominally) 451,155 acres. The area of the unreserves, which is variable, is not important to be noted in the working plan, provided that the limits of the various units of lease are clearly defined.

488. *Scope of the Working Circle.*—The working circle regulates the exploitation of items of forest produce, which have not been already separately dealt with in this working plan.

489. Though the unreserves are under the administrative control of the Revenue Department, the exploitation of the following produce from the unreserves shall be controlled by the District Forest Officer ; Tanning barks of *Cassia auriculata* and *Cassia fistula*, dyeing bark of *Ventilago maderaspatana* (Vembadam), fruits of *Srychnos nux vomica*, *Sapindus emarginatus*, *Terminalia chebula* deer and sambhur horns, honey and wax.

490. Tamarind is the most important item of minor produce in the division. In order to promote competition in its sale and to regulate its exploitation, separate farms have been constituted to include all the reserves on the Hosur Plateau which yield tamarind crop in abundance.

491. The remaining reserved forests of the division are included in the general lease units of the Ranges, which are described in paragraph 500.

492. In the case of the lease units located for Ubrani Agraharam in Ubrani reserved forest, a share of the revenue obtained on account of the minor produce from that locality is payable to the Thrishvakkamdars.

SECTION 2—METHOD OF TREATMENT.

493. The minor produce, except ivory, deer horns and sambhur horns will be exploited through the agency of the contractors.

494. Ivory, deer horns and sambhur horns shall be collected departmentally.

495. *Tamarind Farms.*—Tamarind farms will be formed in each of the Ranges as shown below :—

Serial number and name of farm. (1)	*Reserved forests included.* (2)	*Area.* (3)
		ACS.
	Denkanikota East Range.	
1 Denkanikota	Denkanikota and Noganur Reserved Forests	7,318
2 Aiyur	Aiyur, Aiyur Extension I and II, Nyamasandiram Agraharam, Sameri and Gulhatti Reserved Forests.	21,236
3 Manchi	Manchi, Tholavubetta and Kempakarai Reserved Forests ..	19,767
	Denkanikota West Range.	
4 Thalli	Thalli, Thalli Extension and Javalagiri Reserved Forests ..	19,091
5 Madakallu	Pane and Hulibanda Reserved Forests	25,397

Serial number and name of farm.	*Reserved forests included.*	*Area.*
(1)	(2)	(3)
		ACS.
	Dharmapuri Range.	
6 Pennagaram	Woddapatti, Pennagaram and Bevanurmalai Reserved Forests.	44,835
7 Kodagerai	Guttirayan and Tholavubetta Extension Reserved Forests ..	15,850
8 Kottayur	Morappur, Pikkilimalai and Kesarguli and Kesarguli Extension Reserved Forests.	33,025
	Anchetti Range.	
9 Anchetti	Anchetti, Ubrani except Ubrani Agraharam and Taggatti Reserved Forests.	32,222
10 Urigam	Urigam, Bilikal, Kestur and Kestur Extension Reserved Forests.	42,234
11 Natrapalayam	Mallahalli and Natrapalayam Reserved Forests	22,287
12 Biligundlu	Biligundlu Reserved Forests	15,054
13 Ubrani Agraharam ..	Ubrani Agraharam in Ubrani Reserved Forest	1,600
14 Kundukota	Tamarind trees on either side of the road from Kundukota to Anchetti, thence to northern boundary of Biligundlu Reserved Forest.	Road margins.
	Krishnagiri Range.	
15 Nandibanda	Tamarind trees on either side of the Krishnagiri-Vaniyambadi road lying in Nandibanda Reserved Forest.	Road margins.

496. The usufruct of tamarind in each farm unit shall be leased out separately every year. The sale shall be by public auction. In order that the District Forest Officer and the intending bidders might have an opportunity to judge the nature and value of the fruit crop, the sale should be held after the fruit has set on the trees. The period of lease shall be for eight months from the 1st November to the 30th June.

497. *Cassia Fistula* (Konnai bark).—*Cassia fistula* bark will be exploited on a rotation of five years. Each range including unreserves will be treated as one unit for the lease. The produce in each range will be exploited in the following years :—

Krishnagiri Range	1954–55, 1959–60 and 1964–65.
Anchetti Range	1950–51, 1955–56 and 1960–61.
Dharmapuri Range	1951–52, 1956–57 and 1961–62.
Denkanikota East Range	1952–53, 1957–58 and 1962–63.
Denkanikota West Range	1953–54, 1958–59 and 1963–64.

498. The period of lease shall be for one year from the 1st July to the 30th June. The sale will be by public auction.

499. *Cassia auriculata* (Avaram bark), *Ventilago Maderasapatana* (Vembadam bark) and *Strychnos Nux-vomica Fruits*.—These three items of produce will be leased out jointly every year in public auction. The unit of sale will be a range including the unreserves. The period of lease will be for one year from the 1st July to the 30th June.

500. *Other minor produce*.—All minor produce in the reserved forests other than those specifically mentioned in the foregoing paragraphs and *Terminalia chebula* and *Sapindus emargenata* in the unreserves shall be grouped together and sold every year separately for each unit as shown below :—

Serial number and range.	*Description of lease units.*	*Items of minor forest produce to be collected.*
(1)	(2)	(3)
1 Denkanikota East ..	All the reserved forests and the unreserves of the range.	(1) Kadukkai, (2) Puchankottai, (3) Honey and wax, (4) Sekkai, (5) Serankottai, (6) Kapailpodi, (7) Pungam seeds, (8) Wild castor seeds, (9) Taggarai seeds, (10) Nelakoi, (11) Thethankottai, (12) Mango fruits, (13) Wood-apple, (14) Manchinar, (15) Margosa seeds, (16) Sembaga flower, (17) Korai grass, (18) Illupakottai, (19) Thankai, (20) Custard apple, (21) Avaram bark, (22) Vembadam bark and (23) Nux-vomica seeds.
2 Denkanikota West ..	All the reserved forests and the unreserves of the range.	Do.
3 Anchetti	I. All the reserved forests and the unreserves of the range, excluding Ubrani Agraharam.	Do.
4 Do.	II. Ubrani Agraharam in Ubrani reserved forest.	Do.
5 Do.	1. Pennagaram, Bevanurmalai, Guttirayan, Morappur, Kesarguli and Pickilimalai reserved forests and the unreserves pertaining to them.	Do.

Serial number and range.	*Description of lease units.*	*Items of minor forest produce to be collected.*
(1)	(2)	(3)
6 Dharmapuri ..	II. Badanavadi, Perumbalaimalai, Kalapambadi, Masakal, Parigam A, Parigam B, and Thoppur reserved forests and unreserves pertaining to them.	The 23 items of produce mentioned against item 1 and tamarind.
7 Krishnagiri	I. Galligattam, Marandahalli and its extension and Hudedurgam reserved forests and the unreserves pertaining to them.	The 23 items of produce mentioned against item 1.
8 Do.	II. Maharajagadai, Nerlapalli reserved forests, Maharajagadai Rest-house compound and the unreserves pertaining to them.	The 23 items of produce mentioned against item 1 and tamarind.
9 Do.	III. Nandibanda reserved forest (excluding the Krishnagiri-Vaniyambadi road margins) and Kothur reserved forests and the unreservos pertaining to Nandibanda reserves.	The 23 items mentioned against item 1, and tamarind.
10 Do.	IV. Nerlakottai, Bargur, Mudugampatti, Nartanapalli, Thovarapalli and Thattakalli reserves, the unreserves pertaining to them and the Mudugampatti Rest-house compound.	Do.

501. The sale will be by public auction. The period of lease shall be for one year from the 1st July to the 30th June.

502. *Manure leaf.*—Green manure leaf will be exploited in the fuel coupes of Thoppur and Parigam fuel felling series of Dharmapuri range and in the manure leaf Kumri areas in Nandibanda reserved forest of Krishnagiri range. The area in each range will form one unit of sale. The right to cut and remove manure leaf will be sold in public auction every year in May. The period of lease will be from the 1st June to the 31st December. Only leaves and twigs not thicker than a man's thumb shall be removed.

503. If, in any year, the sale unit could not be sold, permits for the removal of the manure leaves will be issued at Rs. 1–4–0 per cart-load and one anna per head-load. Such cutting and removals shall be supervised by the beat Forest Guard to ensure that only leaves and twigs not thicker than a man's thumb are cut and removed by permit-holders.

Section 3—Other Regulations.

504. During the war-years, many of the tamarind trees in reserved forests were cut down for producing charcoal for producer-gas vehicles and this led to the Government banning the felling of tamarind trees as this species was in fact depleted. The question of artificially raising tamarind topes in reserved forests by 'Kumri' method was therefore considered.

505. Under a scheme sanctioned for the purpose, tamarind kumris were raised in Kalpambody reserved forest of Dharmapuri range, over 67 acres in 1941, 53 acres in 1943 and 10 acres in 1945. No fresh areas were taken up for kumri regeneration in 1947. It will thus be seen that the prospect of continuing the 'Kumri' method of regeneration of tamarind progressively deteriorated.

506. It is, however, proposed that tamarind will be planted as avenue trees along the margins of the Forest Roads in the Division. The planting will be done on an annual programme to spread over all the ranges throughout the priod of this working plan. Plants will be raised in pits $2' \times 2' \times 1\frac{1}{2}'$ and fifty feet apart. The spacing shall be so regulated that the pit on one side is not directly opposite to the pit on the other side. Fencing, not less than 5 feet high shall be put up for each pit. The seeds will be sown in May. If germination does not appear within one month, the sowing shall be repeated till germination comes up. Necessary attention shall be paid to the soil working and weeding the plants in the pits until the plants are well grown to a height of at least three feet.

507. *Record of Statistics.*—All lessees of minor produce shall be required under the terms of their agreements to submit regular accounts of removals of the various items of produce from their leased areas to the District Forest Officer. In the case of leases extending over twelve months, quarterly accounts must be submitted while in the case of tamarind where the lease period is only eight months final accounts must be submitted within one month after the expiry of the lease.

508. *Control Record.*—A control book shall be kept for each range separate sections being allotted for each Minor Forest Produce unit. Information such as the sale amount in each year, the quantity of each of the important kinds of Minor Forest Produce removed by the contractor and all other information which has a bearing on the Minor Forest Produce, viz., the markets and market conditions, etc., shall be recorded in the Control book, which shall be maintained in the District Forest Office.

CHAPTER XII—LANTANA CONTROL WORKING CIRCLE.

Section 1—Constitution of the Working Circles.

509. *General.*—The invasion of lantana and the area that this weed has usurped in North Salem Division has assumed alarming proportions. The total extent of the lantana covered area at the time of the last working plan was 55,557 acres whereas the present area is 100,959 acres. In this division, lantana is said to be present to the extent of about 10,000 stems per acre. It is such an undesirable pest and its evils are so well-known that its existence cannot be ignored. But, no effective method of eradicating it at a reasonable cost has, as yet, been discovered. The " chemical method ", which consisted in spraying over lantana with a solution of sodium chlorate, experimented before the World War II did not give any satisfactory result then ; and, during the war period, further experimenting had to be given up as the chemical could not be had.

510. No entomological treatment has been attempted at the eradication of lantana presumably for the reasons of its probable attack on other forest growth.

511. However, the experiments carried out at Gulhatti, where the bamboo was under-planted in the lantana area, would appear to have solved the lantana-eradication problem satisfactorily. It is therefore proposed to under-plant lantana area annually in three selected areas of forests on the Hosur Plateau on a moderate scale consistent with the availability of labour and considerations of the practical difficulties involved in the operations as an experimental measure.

512. *Constitution to the working circle and annual planting areas.*—Selected blocks of dense lantana areas, 75 acres in extent, in each of Gulhatti, Javalagiri and Ubrani reserved forests (total area 225 acres) will form the Lantana Control Working Circle.

513. The area in each of the three reserved forests will be a planting series. Each planting series consists of 15 annual planting areas of 5 acres each.

514. The working circle, the planting series and the annual planting area are marked in the maps accompanying this working plan.

Section 2—Method of Treatment.

515. *Method of treatment.*—The method of treatment will be underplanting the lantana area with bamboo.

516. *Lay out and planting.*—The area to be planted shall be demarcated with 10 feet cut lines all round. Inspection paths 4 feet wide shall be laid out, dividing the entire area of 5 acres into two plots. In these plots, pits of 1 foot × 1 foot × 9 inches shall be dug at espacement of 6 feet × 6 feet, under the lantana, in May. Two or three bamboo rhizomes one year old shall be planted in each of the pits in June, on rainy days.

517. *Replacing casualties.*—Casualties shall be replaced on rainy days every month till October. If necessary, this work will be done in the second and third year also.

518. *Putting up sign boards.*—Sign boards showing the area and the year of bamboo under-planting shall be put up at convenient corners of each annual plantation area.

519. *Control.*—A journal for each plantation series shall be maintained in the District Forest Office. In it shall be recorded the date of planting and the cost of planting operations. The District Forest Officer shall record in the journal from time to time after inspection as regards the effect of bamboo under-planting in the area over the bambusa growth.

CHAPTER XIII—MISCELLANEOUS REGULATIONS.

Section 1—Fire Protection.

520. In considering the evil of fire in North Salem Division, a distinction must be made between the case of the Hosur plateau and that of the Cauvery slopes. The Hosur plateau is undulating and fairy well-wooded, and one would not normally expect widespread fires in this locality.

521. Fire on the plateau is mainly caused by burning lantana and bamboo and easily tends to become a terribly destructive *Crown Fire* ; the vegetation, especially sandal, is not used to fire, is not fire-resistant and is completely destroyed. Fire does not eradicate, but

only helps lantana. On the Cauvery slopes, on the other hand, fire is caused by burning grass and is generally *Ground Fire* ; the flora represents the surviving species after a vast number of fires. Fires on the Cauvery slopes are caused by graziers, who are thus a class of people with a permanent interest in burning the forest.

522. If the sandal and the bamboo on the plateau are to be conserved, fire must be kept out. One common cause of fire, namely, dead *Bambusa* clumps, may be said to have nearly exhausted itself and the regrowth has formed new clumps in most areas so that we may hope for a reduction in the incidence of fire. But the lantana not only remains but has spread increasingly cent per cent during the last ten years and must be reckoned a serious menace. A lasting solution of the problem of fire on the plateau will be reached only when the lantana has been exterminated. Meanwhile our hope lies in the fact that there can be no conflict of interest between the people and the department as regards the prevention of fire on the plateau since grazing which is the commonest incentive to burning, has been very considerably reduced by the spread of lantana. If, then, all important paths and cart-tracks are systematically cleared and kept open, fires may be prevented to a large extent.

523. General fire protective operations will therefore be confined to the annual clearance of all important footpaths, as well as of existing fire lines. A list of these is given in the following statement. Footpaths shall be cleared to a width of not less than 6 feet. All fire lines shall be cleared to a width of 30 feet and the same applies to the entire length of the Mysore Frontier through its length in reserved forest.

524. The work of clearance shall be undertaken during the months of December and January and shall be completed before the end of January. The cut material shall be removed from the cleared lines and scattered in the forest. In no case shall any burning or fire-tracing be done.

525. In the list that follows it is not intended that all or any part of the lines and footpaths described must necessarily be cleared every year. It is, in fact, probable that only a fraction of the total mileage indicated will have to be dealt with in any year. The work of clearance undertaken annually must be closely related to the needs of the situation. The fact that a particular footpath is included in the list is no justification for its routine clearance. The District Forest Officer must satisfy himself that the work actually proposed for a year is really necessary. Omission to clear lines and footpaths shown in the list will not constitute a deviation requiring sanction.

526. List of existing fire lines in North Salem Division—

Serial number and range. (1)		*Reserved forest.* (2)	*Description of the line.* (3)	*Length.* (4) M. F.	*Width.* (5) FT.
1	Denkanikota East	Aiyur Extension.	Cart-track from Aroojjur to Nilkundi.	1 2	30
2	Do.	Aiyur	Western boundary of old specially protected block.	5 2	30
3	Do.	Do.	Range boundary between Marandahalli reserved forest and Aiyur reserved forests from south to north as far as Anarasikonda and thence along southern boundary of Gudur enclosure ; and thence again along the range boundary till it meets Aiyur extension reserve boundary.	6 2	30
4	Do.	Do.	Boundary between Aiyur reserved forest and Sameri unreserves.	3 0	30
5	Do.	Nyamasandiram Agraharam and Tholavubetta.	Boundary between the reserved forest and Sameri unreserve as far as the old specially protected block line ; thence along the old specially protected block line until it joins the range boundary.	4 2	30
6	Do.	Gulhatti	Eastern line of old specially protected block.	4 1	30
7	Do.	Do.	Western line of old specially protected block.	4 1	30
8	Do.	Do.	The Tholavubetta reserve line from Kanavaikatapalli deserted village as far south as the Gulhatti-Kempanhatti footpath.	1 3	30
9	Do.	Do.	Boundary between Gulhatti and Manchi reserves.	2 6	30
10	Do.	Do.	Footpath from Muthusandiram to Gulhatti (via) Malaiswarangudi.	2 2	30

Serial number and range.	Reserved forest.	Description of the line.	Length.	Width in feet.
(1)	(2)	(3)	(4)	(5)
			M.F.	
11 Denkanikota East ..	Gulhatti ..	Footpath from Sivanapalli to Gulhatti.	2 0	30
12 Do. ..	Manchi ..	The whole of the old specially protected block line.	9 6	30
13 Do. ..	Do. ..	So much of the footpath from Sivanapalli to Chikmanchi as lies within the old specially protected block.	2 2	30
14 Do. ..	Do. ..	The footpath from Tamasanhalli to Chikmanchi which adjoins the boundary line.	2 4	30
15 Denkanikota West ..	Pane	From the point where the Pane-Kundukota footpath meets the Gundumaduhalla northwards and eastwards to the reserve boundary line; thence along the reserve boundary line until it meets the Denkanikota-Anchetti road.	5 1	30
16 Do. ..	Thalli	All along the Mysore boundary ..	13 3	30
17 Do. ..	Do.	Along the Chatramdoddi-Belakarai footpath until it meets the Mysore boundary line.	1 6	30
18 Do. ..	Do.	Along the Genhanhalli-Belakarai footpath.	1 6	30
19 Do. ..	Kestur, Bilikal and Hulibanda.	The whole of Mysore Frontier from the Cauvery to the Nandimangalam Agraharam adjoining reserves.	15 4	30
20 Do. ..	Hulibanda ..	The eastern boundary of Hulibanda reserved forest from the stream east of the Madakallu-Hulibanda footpath to Uduguddai and thence eastwards the then southwards until it meets the Trunisthahalla.	3 2	30
21 Do. ..	Javalagiri ..	All along the Mysore boundary adjoining the reserve.	8 1	30
22 Do. ..	Hulibanda ..	Boundary between Hulibanda reserved forest and Nandimangalam Agraharam.	0 6	30
23 Do. ..	Do. ..	Along the Sulkunta-Hulibanda footpath.	1 4	30
24 Anchetti	Anchetti ..	Footpath from Gerhatti to Sivanapalli until it reaches the Manchi reserve boundary line.	1 5	30
25 Do.	Urigam ..	Along the Taggati-Urigam bridle-path.	1 6	30
26 Do.	Do. ..	Along the Urigam-Odupurane footpath.	1 2	30
27 Do.	Do. ..	Along the reserved forest line connecting Bilikal and Urigam unreserves.	1 0	30
28 Do.	Bilikal ..	Along the Bilikal-Biyalapatti footpath.	2 6	30
		Total ..	110 5	

List of footpaths to be cleared annually in North Salem Division as a measure of fire protection.

Serial number and reserved forest.	Name of the footpath.	Length.
(1)	(2)	(3)
		M. F.
	Denkanikota East Range.	
1 Denkanikota	Tippasandiram-Denkanikota	3 0
2 Hudedurgam	Sathanakallu-Puram	3 4
3 Do.	Sathanakallu-Bevunatham	1 4
4 Aiyur and Extension No. 1 ..	Kachuvadi-Pullahalli	2 6
5 Aiyur	Aiyur-Mukankere	2 6
6 Do.	Doddur to Aiyur-Mukankere footpath	1 6
7 Gulhatti	Gulhatti-Thottikuppam	1 6
8 Gulhatti and Sameri ..	Gulhatti-Siddapuram	4 0
9 Gulhatti and Tholavubetta ..	Gulhatti-Tholavubetta	1 4
10 Gulhatti	Gulhatti-Manchi	2 0
11 Tholavubetta	Tholavubetta-Aiyur (part)	0 5
12 Tholavubetta, Kempakarai and Biligundlu.	From the head of Tholavubetta valley to Anaibiddahalla road.	12 0

Serial number and reserved forest.	*Name of the footpath.*	*Length.*
(1)	(2)	(3)
		M. F.
	Denkanikota East Range—**cont.**	
13 Tholavubetta	Tholavubetta-Kempakarai	3 4
14 Do.	From the above to Manchi enclosure	1 4
15 Kempakarai	Kempakarai-Manchi	1 6
16 Do.	Kempakarai-Kodagerai	2 2
17 Sameri	Aiyur-Siddapuram	1 2
18 Do.	Kodagerai-Siddapuram (part)	0 6
	Total ..	48 2
	Denkanikota West Range.	
19 Thalli Extension	Belakerai-Thimmanaikanahalli (in Mysore Frontier)	1 4
20 Thalli	Ganganhalli-Belakerai	2 4
21 Do.	Belakerai-Devarabetta	1 6
22 Do.	Devarabetta-Mysore Frontier (via) Muthunatham cheruvu.	2 0
23 Do.	Achabal-Mysore Frontier	1 2
24 Do.	Belalu-Mysore Frontier	2 2
25 Javalagiri	Odrapalayam-Kempathipalli	1 4
26 Do.	Gurubanahalli to the above path	0 5
27 Do.	Gurubanahalli-Mysore Fontier	0 5
28 Do.	Gopasandiram-Mysore Frontier	2 2
29 Do.	Cart-tract from Javalagiri to Sennamalam	3 0
30 Do.	Javalagiri-Mysore Frontier	1 3
31 Do.	Cart-track from Javalagiri to Sulakunta up to Nandi-mangalam.	2 6
32 Do.	From Buranahalli to join the cart-track from Javalagiri to Sulakunta.	1 0
33 Pane	Madakallu-Kumbaladur	2 2
34 Do.	Madakallu-Padiganalam (via) Hosadoddi	2 4
35 Do.	Madakallu-Gundumaduhalli	2 3
36 Do.	Pane-Kurumarapalli	3 1
37 Do.	Aliam-Anchetti	3 0
38 Do.	Gonimaranahalli-Metimaduvuhalla	1 7
39 Do.	Kundukota-Anchetti (old bridlepath)	1 0
40 Hulibanda	Sulakunta-Mukandagam	1 4
41 Do.	Belahala-Mysore Frontier	1 6
42 Do.	Sulakunta-Hulibanda	1 4
43 Naganur	Arulnattam-Hulibanda	1 2
44 Do.	Thavarakera-Mattikerai	1 2
45 Do.	Mattikerai-Naganur	0 7
46 Do.	Alasandiram-Alahalli	0 3
	Total ..	48 2
	Dharmapuri Range.	
47 Marandahalli and Extension	Sathanakallu-Dodkahalli	1 0
48 Do.	Dodkalhalli-Panjapalli	2 4
49 Do.	Dodkalhalli-Gudur Thandanapalli	1 5
50 Do.	Panjapalli-Komanur-Bennatham	2 6
51 Do.	Pullahalli-Hattimata	1 7
52 Do.	Agram-Thethukuttai-Allanapalli	2 0
53 Do.	Marandahalli-Kadamakuttai	0 6
54 Do.	Thethukuttai-Munkere	3 7
55 Do.	Allanpalli-Bettamugalalam	3 2
56 Do.	Kilgaligattu-Kadamakuttai	2 1
57 Do.	Kilgaligattur-Bopanur Muniyappam Koyil	0 4
58 Galigattam	Kilgaligattu-Basaveshvarankoyil	0 6
59 Do.	Bettamugalalam-Belarampatti	3 0
60 Do.	Galigattam-Munnimarkoyil-Belarampatti	0 7
61 Do.	Sukaligarabidugu-Belarampatti	2 3
62 Galigattam, Tholavubetta Ex-tension.	Bopanur-Kodagerai	2 0
63 Kesaraguli	Kesaraguli-Alagattu	1 2
64 Do.	Alagattu-Belarampatti	0 6
65 Kesaraguli and Gattirayan	Sattikal-Kodagerai	0 4
66 Kesaraguli and Morappur	Belarampatti-Erimalai-Morappur	3 0
67 Kesaraguli	Kuntikerai-Belarampatti	0 7
68 Kesaraguli, Morapur and Gutti-rayan.	Kargur-Kottayur-Morappur-Kodagerai	6 0
69 Kesaraguli	Belarampatti-Kottayur	1 0
70 Kesaraguli and Morapur	Belarampatti-Morappur	3 0
71 Kesaraguli, Guttirayan and Morappur.	Alagattu-Kolamarti-Gudurmatti	4 4
72 Guttirayan	Kodagerai-Kolamarti-Budamarathurpatti-Chinnar	7 0
73 Pennagaram and Wodapatti	Muthur short cut to Budamarathurpatti	3 0
74 Wodapatti and Biligundlu	Anaibiddamaduvu-Bennatti-Armanuddai Doddi-Hogai-nakal.	5 6
75 Pennagaram and Wodapatti	Pennagaram-Pennapatti-Thimmarayaswamikoyil	1 2
76 Wodapatti and Baiyanurmalai	Hogainkal-Sigarahalli	4 2
77 Do.	Wodapatti-Akulatimmanahalli-Sirupanalur	2 2
78 Baiyanur malai	Sivalingaswamikoyil-Buthipalli	1 6
79 Do.	Buthipalli-Sinnapanallur	1 6
80 Do.	Akulatimmanahalli-Pennagaram road	2 0
	Total ..	81 5

Serial number and reserved forest.	*Name of the footpath.*	*Length.*
(1)	(2)	(3)
		M. F.
	Anchetti Range.	
81 Anchetti	Thomasanpalli-Gerhatti	4 3
82 Ubrani and Taggati	Natrapalayam-Gundalam-Taggati	6 7
83 Do.	Gundalam-Anchetti	3 4
84 Do.	Natrapalayam-Somugalbetta-Mallahalli	7 3
85 Natrapalayam	Natrapalayam-Padigattai	4 2
86 Do.	Natrapalayam-Doddahalla	3 7
87 Mallahalli	Mallahalli-Bekuppa	4 4
88 Do.	Mallahalli-Udupatti	4 0
89 Do.	Mallahalli-Anaguli	3 2
90 Do.	Vantur-Uganiam up to Badakenhalla	2 1
91 Bilikal	Kovehalli-Biyalapatti	3 2
92 Do.	Bilikal-Mysore Frontier	1 1
93 Do.	Binnahalli-Thabguli	4 1
94 Kestur	Manchigoundapalli-Thabguli	2 6
95 Do.	Kestur-Thabguli	2 4
96 Urigam	Taggati-Attinatham	1 4
97 Do.	Attinatham-Ninnanatham	1 4
98 Do.	Urigam-Bilikal	0 6
99 Do.	Urigam-Odupurane	1 6
100 Do.	Attinatham-Odupurane	3 7
101 Bilugundlu	Natrapalayam-Kallumaduvu and thence to Reserved Forest line.	3 4
102 Do.	Kallumaduvu-Chickamandhi	4 6
103 Taggati	Taggati-Devarmatti-Bekuppa on the Cauvery	9 2
	Total	84 6

ABSTRACT.

	M. F.
Denkanikota East Range	48 2
Denkanikota West Range	48 2
Dharmapuri Range	81 5
Anchetti Range	84 6
Grand total	262 7

527. Special protection measures for plantation of firewood, casuarina, teak and softwood have been prescribed in the chapters dealing with the respective working circles.

528. The coupe boundaries (where there are cut lines) shall be completely cleared to a width of 15 feet. Such of these coupe lines as form (1) part of base lines traversing the felling series in the north-south or east-west direction as the case may be (shown on the detail maps in heavy lines) and (2) part of the boundaries of the felling series shall be permanently maintained. The felling series will thus be traversed by a series of parallel cleared lines, which will serve as fire breaks and inspection paths. Thus, at any given time, the worked portion of the felling series, will be isolated by a system of fire lines consisting of (1) that part of the felling series boundary as adjoins the worked area, (2) one or more cleared base lines running north-south or east-west and (3) the coupe lines of the coupe under working.

SECTION 2—ROADS AND BUILDINGS.

529. *Roads.*—The total length of existing forest roads in the division is 90 miles.

530. All forest roads and bridle paths, whether used or not or whether partly or fully constructed, shall be kept in a state of repair. During the annual repairs to roads, the progressive improvement of the roads in width and surface the drainage should be aimed at. An essential function of roads passing through forests is to serve as fire breaks ; the surface of the roads should, therefore, be kept free of inflammable material.

531. *Construction of new roads.*—The following programme of road construction is prescribed. The justification for the road is in each case briefly stated against each road. The years in which construction should be commenced and completed are also shown for each road. The roads will in all cases be fair weather roads with a net width of 12 feet, exclusive of side drains. A maximum average gradient of 1 in 20 is prescribed.

532. The roads will be constructed as funds are made available. Adequate reasons for any change in the order should be recorded in the appropriate place of the control journal. Chief Conservator's sanction should be obtained if the construction of any road is considered unnecessary.

List of proposed roads in North Salem.

Serial number and range. (1)	*Name of proposed road.* *From* (2)	*To* (3)	*Necessity for the road.* (4)	*Proposed year of construction.* (5)	*Approximate length in miles.* (6)	*Estimated cost.* (7) RS.	*Remarks.* (8)
1 Denkanikota East.	North-western of Tholavubetta reserved forest.	Anaibiddahalla road down the Tholavubetta valley.	For extraction of bamboos from Tholavubetta, Kempakarai, Guttirayan and Biligundlu series.	1950–51	12	4,500	..
2 Do.	Gulhatti ..	Manchi reserved forest line.	For extraction of bamboos from Gulhatti and Manchi series.	1951–52	2½	1,000	Extension of the road from Gulhatti is proposed and improving the existing cart-track.
3 Do.	Aiyur-Sameri Loap road.	Siddapuram.	For opening the forest and for the extraction of bamboos from Sameri series.	1952–53	7	2,500	..
4 Krishnagiri.	Siddapuram Bettamulalam.	Belarampatti.	Extraction of bamboos and Sandal from Galigattam and Marandahalli series and from the plateau.	1953–54	8	3,000	The existing bridle path may be improved in many places.
5 Anchetti.	Gerhatti ..	Bilugundlu and Natrapalayam.	For extraction of bamboos from Anchetti, Ubrani and Biligundlu series.	1954–55	9	4,000	..
6 Denkanikota West.	Javalagiri ..	Hulibanda (via) Sulakunta.	For extraction of bamboos from Hulibanda, Javalagiri and Pane series.	1955–56	10	2,500	Improvements by realizing the existing cart-track.
7 Denkanikota East.	Manchi reserved forest line.	Manchi enclosure.	To facilitate the extraction of bamboos from Manchi series.	1956–57	4	2,500	..
8 Denkanikota West	Sulakunta ..	Anchetti Taggatti road (via) Arula - natham.	For extraction of sandal and bamboos from Hulibanda and Pane series.	1956–57	10	4,000	..
9 Denkanikota East.	Manchi ..	Anchetti-Pennagaram road (via) Talavadi.	For extraction of bamboos from Manchi, Kempakarai and Biligundlu series.	1957–58	4	1,500	..
10 Anchetti.	Taggati ..	Urigam ..	For extraction of bamboos from Urigam, Bilikal and Taggati series.	1959–60	6	3,000	Existing bridlepath may be partly utilized. Partial financial help may be got from the local fund. Since this will be a village road also.
				Total ..	72½	28,500	

533. The figures of cost shown in the statement are rough estimates founded on a general knowledge of the country and on actual costs of similar roads built in the past. They are not to be regarded as in any way binding on the District Forest Officer.

534. *Buildings.*—All departmental buildings shall be kept in a state of repair. The surroundings of rest-houses, inspection-sheds and residential quarters shall be kept clear of under growth.

535. *Construction of new buildings.*—A programme of building construction in the order of urgency is laid down in the subjoined statement. The guiding factors in the selection of sites for buildings should be (i) availability of good water, (ii) nearness to a road and (iii) nearness to a village. Rest-houses shall contain accommodation for two officers and shall be complete with out-houses.

536. They must also be equipped with roofed pit latrines. Inspection sheds shall consist of one large room, at least one bath room, a verandah and a detached kitchen with a spare room for servants. Approved type designs must be adopted for all buildings.

537. The constructions of quarters for foresters and forest guards is provided for only in places where such quarters are considered to be necessary or highly desirable.

538. The buildings will be constructed as funds are made available. Adequate reasons for any change in the order should be recorded in the appropriate place of the control Journal. Chief Conservator's sanction should be obtained if the construction of any building is undesirable.

List of proposed buildings in North Salem Division.

Serial number and range. (1)	*Locality.* (2)	*Name of building.* (3)	*Reasons for construction.* (4)	*Proposed year of construction.* (5)	*Estimated cost.* (6)
					RS.
1 Anchetti ..	Biligundlu ..	Inspection shed.	The previous inspection shed was washed away in the floods of 1924. A new inspection shed is therefore necessary for inspecting the timber areas on the Cauvery slopes.	1950–51	1,500
2 Dharmapuri.	Hogainakal ..	Quarters for Forest Guards.	Government residential quarters at this place are necessary for the Forest Guard stationed at the place. There are none at present.	1950–51	1,000
3 Do.	Eriyoor ..	Inspection shed.	The inspection shed is necessary for inspecting the Badanavadi and Perumbalai reserved forests	1951–52	1,000
4 Denkanikota East.	Gulhatti ..	Quarters for Forester.	Government residential quarters at this place are necessary for the Forester, who is stationed at the place; at present, there are none.	1951–52	1,500
5 Anchetti ..	Manchi-Goundan-palli.	Quarters for Forest Guards.	Do.	1952–53	1,000
6 Denkanikota East.	Manchi ..	Do.	Do.	1952–53	1,000
7 Krishnagiri.	Panjapalli ..	Inspection shed.	The inspection shed is necessary to inspect the Hudedurgam and Marandahalli reserved forest.	1953–54	1,500
8 Denkanikota East.	Siddapuram ..	Do.	The existing inspection shed is inadequate for camping officers and it can be used as a shed for the Range Officer. A new inspection shed for Gazetted Officers is therefore necessary.	1954–55	1,500
9 Dharmapuri,	Kodagerai ..	Quarters for Forest Guard.	Government residential quarters at this place are necessary for the Forester, who is stationed at the place; at present there are none.	1954–55	1,000
10 Denkanikota West.	Kundukota ..	Inspection shed.	The inspection shed is necessary to inspect of Pane and Gulhatti reserved forests. Kundukota is an intermediate camp between Anchetti and Denkanikota.	1955–56	1,500

Serial number and range.	*Locality.*	*Name of building.*	*Reasons for construction.*	*Proposed year of construction.*	*Estimated cost.*
(1)	(2)	(3)	(4)	(5)	(6) RS.
11 Dharmapuri.	Beedamarathu-patti.	Inspection shed	The inspection shed is necessary to inspect the remoter parts of Guttirayan reserved forest.	1956–57	1,500
12 Denkanikota West.	Kundukota ..	Residential quarters for Forest Guard.	Government residential quarters at this place are necessary for the Forest Guard, who is stationed here ; there are none at present.	1956–57	1,000
13 Anchetti ..	Manchigoun-danpalli.	Inspection shed.	The inspection shed is necessary to inspect the interior parts of Kestur reserved forest and its extension.	1957–58	1,500
14 Krishnagiri.	Kadamakuttai.	Do.	Between Siddapuram and Marandahalli an intermediate camping place is necessary to facilitate inspection of the interior portions of Marandahalli reserved forest. Hence the building of an inspection shed at Kadamakuttai is proposed.	1957–58	1,500
				Total ..	18,000

Section 3—Improvement of Water Facilities.

539. No new wells are proposed to be dug. The existing wells shall be kept in a state of repair.

Section 4—Boundaries.

540. The local beat subordinates shall clear and maintain all reserved forest boundaries.

Section 5—Rain-gauges.

541. The forest rain gauge stations at Aiyur, Javalagiri, Devarbetta, Biligundlu, Hogainakal, Thoppur and Medugampalli shall be carefully maintained and placed in charge of Officers not lower in rank of a Forester. Daily record of rainfall shall be kept at each station.

Section 6—Control.

542. Control records and maps, which are to be maintained in the District Forest Office have been dealt with under the various working circle. The posting and maintenance of control records and maps is a matter of vital importance and the District Forest Officer shall be primarily responsible in keeping them posted up-to-date from time to time.

543. *Register of deviations.*—A consolidated register shall be maintained in the District Forest Office, in which every case of deviation from the prescriptions of this working plan, the need for the deviation and the authority sanctioning it shall be recorded from time to time.

CHAPTER XIV—ESTABLISHMENT AND LABOUR.

Section 1—Establishment.

544. The last working plan made out a case for the employment of 30 Foresters for the division. Though certain reserved forests from Central Salem and West Vellore Divisions were transferred to North Salem division in 1941, the number of Foresters was reduced to 25 in the same year as the extraction of sandal sapwood trees was abandoned in that year.

545. Due to the reduction of the 29 sandal felling series to 15, and also due to the reduced cultivation of lac under this working plan, only 23 Foresters are considered sufficient as shown below :

	Foresters.
1 For 15 sandal felling series	15
2 For 17 felling series in Krishnagiri and Dharmapuri ranges.	2
3 For the final cleaning depot at Denkanikota	1
4 For other special works such as lac cultivation, plantations, roads, buildings, etc.	5
Total ..	23

546. The posts of two foresters shall therefore be retrenched with effect from 1st April 1950. From 1st June 1948, four Panchayat reserves, viz., Hudedurgam, Varatanapalli, Thogarapalli and Thattakal have been taken over from the Revenue Department. Hudedurgam reserved forest has been added to the existing beat of the same name and Varatanapalli has been added to Bargur beat. Thogarapalli (900 acres) and Thattakal (857 acres) could not be tacked on to any of the existing beats in view of their isolated position. These two reserved forests are situated at about four miles apart and they will form one beat in Krishnagiri range. One forest guard and one watcher will be employed for this new beat, which will be known as Thogarapalli beat.

Section 2—Labour.

547. The labour supply in the division is adequate.

CHAPTER XV—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

Section 1—Financial Forecast.

548. The subjoined statements show—

(i) the estimated revenue and expenditure during the period of the wor king plan;

(ii) the actual revenue and expenditure during the three-year period ending 1947–48 compared with financial forecast; and

(iii) an abstract of the forecast.

549. Sandalwood is the most valuable as well as the most important commodity produced in the division, and the financial results of the working of the division are, in consequence largely dependent on the prevailing price of sandalwood. The chief consuming markets for sandalwood lie outside India and are beyond our control. The price of sandalwood is greatly affected by the policy of followed from time to time by Mysore which is the biggest producer. The estimates of revenue are therefore purely tentative and are subject to considerable variations according to fluctuations in the price of sandalwood. It may, however, be stated that the price of sandalwood has been assuming an upward trend after the war.

550. The estimates indicate an average annual surplus of Rs. 3,85,010.

I. Sandal Working Circle.

Revenue.	*Amount.*	*Expenditure.*	*Amount.*
	RS.		RS.
1 By sale of 2,000 tons of final cleaned sandalwood at Rs. 3,000 per ton.	60,00,000	1 Production and transport of final cleaned sandalwood to Tiruppattur sale depot at Rs. 145* per ton.	2,90,000
		2 Tending 19,300 acres, on an average of effective sandal areas annually for 15 years at one anna per acre.	18,100
		3 Opening propagation centres in Krishnagiri, Dharmapuri ranges at Rs. 30 annually (lump sum).	450
		4 Dearness allowance of watchers on temporary establishments at Rs. 13,180 per annum for 15 years.	97,700
	60,00,000		4,06,250

Average rate obtained at Tiruppattur sale depot during the three-year period ending 1946–47.

* The average cost of production and transport to Tiruppattur.

II. Bamboo Working Circle.

1 By sale of bamboo coupes in 26 felling series at Rs. 30,000 per annum.	4,50,000	Nil.	Nil.
	4,50,000		Nil.

Past three years' average revenue from bamboo was Rs. 38,480. Due allowance has been made for possible fall in prices of bamboo coupes during future years.

III. Fuel Working Circle.

1 By sale of 41,400 acres of fuel coupes in 17 felling series at Rs. 25 per acre.	10,35,000	1 Survey and demarcation of fuel coupes at Rs. 20 per coupe.	5,100
		2 Preparing, numbering, transporting and planting 1,020 coupe stones at Rs. 5 per stone.	5,100
	10,35,000		10,200

Revenue.	*Amount.*	*Expenditure.*	*Amount.*

IV. Firewood Plantation Circle.

	RS.		RS.
1	..	....	..

V. Casuarina Plantation Working Circle.

1 By sale of the standing growths on 180 acres at Rs. 8 per acre.	1,440	1 Planting operations over 180 acres with casuarina at Rs. 70 per acre.	12,600
		2 Fire protection operations at Rs. 25 annually.	375
	1,440		12,975

VI. Experimental Teak Plantation Working Circle.

1 No appreciable revenue can be anticipated as the area is in the interior to have demands for firewood.	..	1 Planting up 75 acres of teak and tending at Rs. 120 per acre.	9,000
		2 Fire protection operations	300
	..		9,300

VII. Experimental Softwood Plantation Working Circle.

1 By sale of the standing growths on 30 acres at Rs. 10 per acre.	300	1 Planting operations over 30 acres with Melia dubia and Ailanthus excelsa and subsequent tending at Rs. 40 per acre.	1,200
		2 Fire protection operations	150
	300		1,350

VIII. Grazing Working Circle.

1 By sale of grazing permits at Rs. 23,800 per annum.	3,57,000	1 Cost of sign boards at Rs. 50 per annum.	750
2 By issue of penning at Rs. 400 per annum.	6,000	2 Cost of improvement to existing watering facilities at Rs. 4,000 and interest at 3 per cent per annum for ten years.	1,200
3 By sale of special grazing permits in Rotational Grazing blocks at Rs. 800 per annum.	12,000	3 Maintenance of boundaries of paddocks of rotational grazing blocks at Rs. 10 per block annually.	3,600
	3,75,000		5,550

IX. Lac Working Circle.

1 By sale of 130 maunds of scraped lac at Rs. 105 per maund of 82 lb.	13,650	1 Cultivation of 130 maunds of lac at Rs. 30 per maund.	3,900
	13,650		3,900

X. Minor Forest Produce Working Circle.

1 By sale of tamarind farms, other kinds of produce, barks and green leaf manure, etc., at Rs. 13,073 per annum.	1,96,100	....	..
	1,96,100		..

XI. Lantana Control Working Circle.

1	..	1 For under planting bamboos in lantana areas over 225 acres at Rs. 30 per acre.	6,750
	..		6,750

Revenue.	Amount.	Expenditure.	Amount.
	RS.		RS.
		XII. Miscellaneous Regulations.	
1 By sale of confiscated produce, fines, forfeitures, rents, compounding fees, etc., at Rs. 13,200 per annum.	1,98,000	1 Fire protection—	
		(a) Clearing 111 miles existing fire lines 30 feet wide at Rs. 4 per mile.	6,600
		(b) Clearing 263 miles of the more important footpaths passing through reserves (6 feet wide) at Rs. 5 per mile.	19,725
		(c) Fire tracing round teak and other plantations over a distance of 10 miles at Rs. 5 per mile.	750
		2 Cost of demarcation and maintenance of boundaries at Rs. 350 per annum.	5,250
		3 Purchase of stores, tools, plants, etc., at Rs. 150 per annum.	2,250
		4 Roads and bridges—	
		(a) Maintenance of 90 miles of existing roads at Rs. 8,000 per annum.	1,20,000
		(b) Construction cost of 74 miles new roads Rs. 27,825—Interest at 3 per cent per annum for ten years.	8,340
		(c) Maintenance of proposed new roads of 74 miles for ten years at Rs. 45 per mile.	33,300
		5 Buildings—	
		(a) Annual maintenance of existing at Rs. 3,300 per annum.	49,500
		(b) Construction of new buildings Rs. 21,600—Interest at 3 per cent for ten years.	6,480
		(c) Maintenance of proposed new buildings for ten years.	6,000
		6 Wells and water sources—	
		Maintenance of existing wells at Rs. 500 per annum for fifteen years.	7,500
		7 Rainguage stations—	
		Maintenance of the existing seven rainguage stations at Rs. 35 per annum for fifteen years.	525
	1,98,000		2,66,220
		XIII. Establishments.	
....	..	1 Controlling staff—	
		One District Forest Officer (Madras Forest Service) at Rs. 557 per mensem.	1,00,260
		2 Executive staff—	
		Five Rangers at Rs. 214 per mensem.	1,92,600
		Twenty Foresters at Rs. 75 each per mensem.	3,10,500
		3 Protective staff—	
		Fifty-five Forest Guards at Rs. 21–8–0 each per mensem.	2,12,850
		4 District Forest Office Establishment—	
		One Head Clerk at Rs. 105 per mensem.	18,900
		One Accountant at Rs. 105 per mensem.	18,900
		Four Lower Division Clerks, one Sandalwood Clerk and one Typist at Rs. 75–8–0 per mensem each.	81,540
		Four peons at Rs. 22 per mensem each.	15,840

Revenue.	*Amount.*	*Expenditure.*	*Amount.*
	RS.		RS.
		XIII. *Establishments*—cont.	
		5 Range Establishment—	
		Five Range Clerks at Rs. 75–8–0 per mensem each.	67,950
		Eight peons at Rs. 22 per mensem each.	31,680
		6 Temporary Establishment—	
		One District Forest Office watcher, one Krishnagiri Range Office watcher, one Dharmapuri Range Office watcher at Rs. 9 per mensem each.	4,860
		Forty-four beat watchers at Rs. 9 each per mensem and eleven beat watchers at Rs. 10 each per mensem.	91,080
		Three bungalow watchers at Rs. 4 per mensem.	2,160
		Allowances—	
		1 Travelling allowances at Rs. 5,500 per annum.	82,500
		2 Fixed travelling allowance of 23 foresters at Rs. 13–12–0 per mensem.	56,925
		3 Other compensatory allowance at Rs. 550 per annum.	8,250
		4 Dearness allowance at Rs. 23,000 per annum.	3,45,000
		Contingencies—	
		Supplies and services, tour charges, etc., at Rs. 2,700 per annum.	40,500
		Direction Office—	
		Expenditure incurred on account of the "Establishment" including the Conservator which is debitable to this working plan.	89,550
			17,71,845

N.B.—The amount has been calculated on the basis of expenditure incurred under "Establishments" during 1947–48.

ABSTRACT.

	Items.	*Revenue.*	*Expenditure.*
		RS.	RS.
I	Sandalwood Working Circle	60,00,000	4,06,250
II	Bamboo Working Circle	4,50,000	..
III	Fuel Working Circle	10,35,000	10,200
IV	Firewood Plantation Working Circle	..	..
V	Casuarina Plantation Working Circle	1,440	12,975
VI	Teak Plantation Working Circle	..	9,300
VII	Softwood Plantation Working Circle	300	1,350
VIII	Grazing Working Circle	3,75,000	5,550
IX	Lac Working Circle	13,650	3,900
X	Minor Forest Produce Working Circle	1,96,100	..
XI	Lantana Working Circle	..	6,750
XII	Miscellaneous	1,98,000	2,66,220
XIII	Establishment	..	17,71,845
	Total	82,69,490	24,94,340

(1) Anticipated surplus of revenue over expenditure during the fifteen-year period .. 57,75,150

(2) Anticipated annual surplus 3,85,010

SECTION 2—COST OF WORKING PLAN.

551. The cost of working plan is shown in the following statement.

Particulars.	Amount.
	RS.
10. C. Establishments—	
A. Pay of Officers—(Voted)	5,597
B. Pay of Establishments— Permanent, Temporary	5,695
C. Travelling Allowances	4,800
Fixed Travelling Allowances	561
Other compensatory Allowances	122
Dearness Allowances	3,435
Contingencies	856
Total ..	21,066

Cost of the plan per acre of Reserved Forest dealt with .. .. Re. 0-0-10.

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Ootacamund.

CHAPTER XVI—SUMMARY OF PRESCRIPTIONS.

CHAPTER I—BASIS OF PROPOSALS.

PARAGRAPH.

1. This working plan deals with the whole of the North Salem Division—
   The objects of management are exploitation of forest, the discharge of the obligations and conservancy and improvement of the forest 205

2. Eleven working circles have been formed. A statement showing the distribution of the working circles is given 208

3. Period of working plan—Fifteen years from 1950–51 to 1964–65 209

CHAPTER II—WORKING PLAN FOR THE SANDAL WORKING CIRCLE.

1. Constitution—
   Significant sandal areas occurring in the reserves and unreserves of the division have been included in the working circle. Certain sandal areas in reserves have been excluded owing to their smallness or remoteness 210
   Measures of exploitation prescribed are applicable to both reserves and unreserves. Prescriptions relating to cultural operations and other improvements primarily relate to reserved forests 211

2. Area—
   The area of the working circle is 278,928 acres of which 97,414 acres represent the effective sandal area 215

3. Felling series—
   The working circle has been divided into 15 felling series 218
   Sandal bearing unreserves have been constituted into distinct felling series 219
   A statement showing the particulars of the felling series is given 221

4. Method of treatment—
   The exploitation must be confined to the removal of dead trees only 228

5. Silvicultural system—
   Selection system is to be followed 229

6. Rotation—
   None can be fixed as only dead sandal trees are to be extracted 230

7. Felling cycle—
   A felling cycle of five years fixed 232

8. Each felling series has been divided into five coupes one of which shall be worked in seque ce every year ; boundaries of the coupes marked in the map 233

	Paragraph.
9. The estimated yield of rough cleaned sandalwood will be about 600 tons for each felling cycle	234
10. Method of executing the fellings—	
One coupe in each felling series to be exploited every year	235
Felling to be carried departmentally	236
11. Method of executing the fellings—	
All dead trees are to be extracted. All fallen branches and broken stems are to be removed. Detailed instructions for felling of sandalwood trees given in sandalwood felling rules are to be followed	237
12. Tabular statement of fellings is given	238
13. Silvicultural regulations—	
No general tending is to be done ; Climbers may be cut by subordinates during enumeration, but this should involve no expenditure	243
14. Artificial regeneration—	
Sandal propagation centres are prescribed in certain specified beats—Detailed instructions regarding the choice, formation, sowing and maintenance of propagation centres are given	250–251
15. Other regulations—	
A statement showing the sandal areas excluded from the working circle is given. These areas shall be gone over by the respective beat guards once in five years and all dead sandal trees shall be extracted	252
16. Fire protection—	
Dealt with under miscellaneous regulations—Chapter XIII	253
17. Control—	
The maintenance of a control book, record of works, felling series journal, journal for propagation centres and control maps prescribed	254

Chapter III—Working Plan for the Bamboo Working Circle.

1. Constitution—	
This working circle includes all areas in the reserve swhere bamboos occur in workable quantities and certain blocks of unreserves where the extent and density of bamboo growth are such as to warrant regular exploitation	257
2. Bamboo areas in the Reserved Forests are called the " Reserve section " and those in unreserves, the " Unreserve section "	260
3. Area—	
The working circle has an area of 212,142 acres of which reserve section is 176,890 acres and that of unreserve is 35,252 acres	262
4. Felling series—	
The working circle comprises of 22 reserve felling series and 4 unreserve felling series	263
Statement showing the names, distribution and limits of all the felling series in both reserve and unreserve sections given	266
5. System of management—	
The method of exploitation will be selection and thinning of bamboo clumps ..	270
6. The felling cycle is three years	271
7. Agency of fellings—	
The felling shall be made through agency of contractors under lease system ..	272
8. Division into coupes—	
Each felling series has been divided into three coupes	273
9. Period of lease will be one year from 1st April to 31st of March	278
10. Regulation of the working—	
The felling will be regulated entirely by area, one coupe being felled during one financial year as per tabular statement	280
The lease of bamboo coupes in the unreserves shall be subject to the statutory right of the local villagers	281
Bamboo in the unreserves, when not leased to contractor, will be permitted to be removed in permits for bona-fide agricultural and domestic purposes	282
11. Bamboo felling rules	283
12. Statement showing the areas and boundaries of bamboo coupes in each felling series is given	287

PARA-GRAPH.

13. Grazing regulation—
The whole working circle will be open to grazing 288

14. Fire protection is dealt with under Miscellaneous Regulations—Chapter XIII .. 289

15. Publicity for sale is to be given in Salem and Bangalore 290

16. Road-making: Bamboo contractors are to obtain previous permission of the District Forest Officer for making a new cart-track within or outside their bamboo coupe or felling series. Proposed alignment must also be approved 293

17. Record of statistics—
The contractor shall be required to submit monthly accounts of all bamboo removals made in his leased area not later than fifteenth of the month following 294

18. Control—
Summary of operations in the working circle is to be entered in the control book for each financial year 295

Chapter IV—Working Plan for the Fuel Working Circle.

1. Constitution—
The working circle consists of selected blocks of reserved forests in the vicinity of certain towns and villages where demand for firewood exists 296

2. Area—
The aggregate area of the working circle is 41,400 acres 297

3. Felling series—
The working circle is divided into 17 felling series. A statement showing the distribution and area of each felling series is given 298

4. Rotation will be 30 years 302

5. Method of treatment—
The method of felling proposed is simple coppice with reservation of sandal, tamarind and soapnut trees 303

6. Regulation of working—
The felling will be regulated by area 304

7. Method of felling—
One coupe in each felling series shall be offered for felling every year 305
Each coupe will be divided into a convenient number of strips, not less than two strips nor more than four strips in a coupe 306

8. Agency of fellings—
Felling shall be made through the agency of contractors 307
The coupe shall be sold every year in public auction. The lease period shall be from the 1st January to the 31st December of the year 308
Coupes left unsold in auction and subsequently sold in special sale or on tender to be leased only for the period ending the 31st December of the year 309

9. Coupe arrears—
Arrear areas of annual coupes are to be sold in public auction or on tender as the case may be 310

10. Felling rules—
(1) The coupe shall be felled strip by strip 311
(2) Felling in the coupe shall be done only by contractors' coolies 312
(3) The cutting trees must be close to the ground 313
(4) Any brushwood of the felled trees should not be allowed in the coupe so as to obstruct coppicing 314
(5) All felled materials should be properly stacked 315
(6) All trees yielding timber should be hammer marked before removal 316

11. Tabular statement of felling is given 317

12. Silvicultural operations—
Felled fuel coupes will be left to regenerate themselves through coppicing 319

13. Other regulations—
Demarcation of worked coupes 321
Felled fuel coupes shall remain closed to grazing for four years including the year of felling 322
Cattle path in the coupe to be demarcated, where required 323
Cutting and removal of grass allowed free of cost in " closed " coupes 324

PARA-GRAPH.

14. Fire protection—
Intensive fire protection of the felled fuel coupes is prescribed in Miscellaneous Regulations 325

15. Record of statistics—
Every contractor is to submit to Range Officer monthly statement of yield 326
The yield figures should be recorded in control book 327

16. Control—
The maintenance of control book, record of works, and regeneration ledger and control maps is prescribed 328–329

CHAPTER V—WORKING PLAN FOR THE FUEL PLANTATION WORKING CIRCLE.

1. Constitution—
Blocks I and II in Thoppur Reserved Forest will constitute the working circle .. 332
2. The area of the working circle is 960 acres 333
3. The whole area will form one planting series 335
The planting series will be divided into six planting blocks 336
4. Method of treatment—
Allocation of area to kumridars 337
Extent of area to be allotted to kumridars 338–339
5. Issue of permits—
Allotment of land to kumridars is to be covered by issue of permits under section 21 of the Madras Forest Act 340
6. The area containing all individual plots of land should be surveyed and demarcated and handed over to the kumridars before the middle of January 342
7. Clearing the land and removing the felled material is to be done by the kumridars .. 343
8. Burning the brushwood and slash and ploughing the area to be completed early in May or before the rains set in 344
9. The belt for tree crop shall be 4 feet wide and 22 feet apart from centre to centre and should be laid out from east to west 345
10. Tree crop species shall be sown mixed in the 4 feet wide belt and sowing to be completed by the end of May 346
11. Soil working and weeding in the tree crop belts shall be carried out in August, October and December in the first year and in May, August, October and December in the second and third years 347
12. Seedlings are to be thinned when they are about 12 inches high 349
13. Kumridars shall not be allowed to raise cholam and castor until the tree crops are about 6 feet high 350
14. At the end of the fifth year and before the areas are redelivered to the department, the kumridars are to plough food-crop belts in which seeds of spear grass will be sown departmentally 351
15. Grazing—
The kumried areas shall be closed to grazing for seven years including the year of commencement of kumri-work. At the end of this period, rotational grazing may be introduced in the area 352
16. The beat staff, as part of its normal duties shall be responsible to see that the kumri areas are not subjected to fires 353
17. Control—
Register showing the allotment of lands for kumri cultivation and Control Journal are to be maintained 354
All areas regenerated by kumri method are to be marked on control map on 4 inches to 1 mile scale 357

CHAPTER VI—WORKING PLAN FOR CASUARINA PLANTATION WORKING CIRCLE.

1. Constitution—
The working circle is formed to cover selected block of 180 acres in the aggregate in Sanamavu, Noganur and Hudedurgam Reserved Forests in the Hosur plateau .. 360
2. There will be three plantation series 362
3. Each plantation series will consist of fifteen planting areas 363

PARAGRAPH.

4. Method of treatment—
The method adopted will be to replace the existing forest growth in the working circle by planting casuarina 264

5. The annual planting area is to be surveyed and demarcated before the end of December. Any sandal tree containing heartwood, which is found in the areas is to be extracted departmentally 365

6. The tree growth in the area shall be sold to contractor in public auction with the condition that the purchaser shall clear fell the area, remove the felled material and hand back the area to the department by the 31st March 366

7. The area will be cleared of all growth and cut materials burnt by the end of April .. 367

8. The area should be aligned and pits of 1 foot cube dug in May 368

9. One year old casuarina seedlings will be planted in prepared pits 369

10. Casualties will be replaced as and when noticed 370

11. Soil working and weeding shall be done in August, October and December in the first year 372

12. The side branches of saplings will be pruned in the fifth year and, if found necessary, in the seventh year also 373

13. The rotation will be fifteen years. At the end of the fifteenth year, the growth will be clearfelled and the area replanted 374

14. Nursery—
Instructions for raising nurseries are given 375

15. The plantation shall be closed to grazing for five years including the year of planting 376

16. Litter shall not be allowed to be removed 377

17. Fire protection—
The outer periphery of the planted block will be fire traced 378

18. Control—
A Plantation Journal is to be maintained 379

CHAPTER VII—WORKING PLAN FOR THE EXPERIMENTAL TEAK PLANTATION WORKING CIRCLE.

1. Constitution—
The working circle is situated in an area of 75 acres in Nyamasandiram Agraharam Reserved Forest 384

2. There will be one plantation series with fifteen planting areas 386

3. The method of treatment is to replace the existing deciduous jungle growth by introducing teak artificially 387

4. The area will be surveyed and demarcated on the ground by the end of December and, at the same time all sandal trees, which will yield heartwood and which may be found in the area, will be extracted departmentally 388

5. All the growth in the area shall be felled completely by Department before the end of February and the felled material burnt early in April 389

6. The whole area shall be aligned and stacked at an espacement of 6 feet by 6 feet before the end of April 390

7. Planting shall be done in May or as soon as south-west monsoon breaks whichever is earlier 391

8. Teak stumps shall be planted in crow-bar holes 393

9. Casualties shall be replaced in July and September in the year of planting and, if necessary, during the second year, in July 394

10. Weeding will be done as follows :—
First year—July, September, December.
Second year—July, September, December.
Third year—May.
Soil working will be done in the first and second years along with weeding .. 395

11. Tending shall be carried out during the fifth year in May 396

PARAGRAPH.

12. The District Forest Officer shall inspect the plantation in the sixth year and decide about thinning, which, if carried out, will be mechanical thinning. A second thinning in the tenth year will, if called for, will be done. If a third thinning in the fifteenth year is considered necessary, it shall be a silvicultural thinning .. 397

13. Rotation is to be fixed at the next revision of the working plan 398

14. Plantations shall be closed to grazing for six years including the year of formation. 399

15. The outer periphery of the area planted shall be fire traced in January each year .. 400

16. Control—
Plantation journal shall be maintained 401

17. District Forest Officer to inspect the plantation and record his own observations 402

18. Surveyed sketch of the plantation shall be filed in the plantation register 403

CHAPTER VIII—WORKING PLAN FOR THE EXPERIMENTAL PLANTATION OF SOFTWOOD TIMBER.

1. Constitution—
An area of 30 acres selected in Noganur Reserved Forest forms the working circle. 405
The whole working circle of 30 acres will form one plantation series which is divided into fifteen annual planting areas of 2 acres each 407

2. Method of treatment adopted is to replace the existing miscellaneous deciduous species by a mixed growth of *Melia composita* and *Ailanthus excelsa* species 408

3. The annual planting area shall be surveyed and demarcated by the end of December. 409

4. The tree growth in the area will be sold in public auction, the successful bidder being required to complete the felling, remove the fuel, except the brushwood and slash, and hand back the area by the end of March 410

5. If no contractor is forthcoming, felling will be done depatmentally and the fuel sold in auction 411

6. The residual growth in the felled area will be cut back departmentally and the brushwood and slash heaped and burnt in April 412

7. The whole area shall be aligned and stacked 9 feet by 9 feet before the end of April .. 413

8. Seedlings of *Melia composita* and *Ailanthus excelsa* are to be planted in crow-bar holes at stakes in rains, in June 414–415

9. Seeds of the required species should be collected in the appropriate season 416

10. The *Ailanthus* seeds should be treated in cold water before sowing 417

11. Seeds of each species are to be sown in separate nursery bed. *Melia* seeds are to be sown in March and *Alianthus* seeds in May-June. The seed beds are to kept free from weeds at all times 418

12. The planted area is to be closed to grazing for ten years including the year of planting. 419

13. The outer periphery of the planted area shall be fire traced before the end of January each year 420

14. Casualties shall be replaced as and when they occur till October in the first year and, if necessary, in the second year also 421

15. Clear weeding by cutting back all weeds in the area and soil working will be done in the first and second years 422

16. All climbers and other growth shall be cut during the third and fourth years. Climber cutting after the fourth will be decided by the District Forest Officer after inspection 423

17. Thinning will be decided by the District Forest Officer in the fifth year after inspection 424

18. Rotation will be considered at the next revision of the working plan 425

19. Control—
A plantation journal for each plantation and nursery journal will be maintained in the District Forest Office 426

PARA-GRAPH.

CHAPTER IX—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

1. Constitution—
The working circle comprises all the reserves of the division 427

2. Goats shall not be permitted into the reserved forest 428

3. The total area which will be open to grazing in the division will be 451,968 acres and affords a normal possibility of grazing incidence at 4 acres per cow unit .. 429

4. Ordinary system of grazing and rotational grazing system will be adopted 430

5. Rotational grazing blocks will be opened in the " Minor forests " in Denkanikota West, Dharmapuri and Krishnagiri ranges and in the " Major forests " of Anchetti and Dharmapuri ranges 436

6. Rotational grazing in the minor class of forests will be introduced simultaneously in 1950–51 and, in the major class of forests, in two blocks each year 438

7. Grazing fees for cattle resorting to rotational grazing blocks will be six annas per cow unit in minor class of forests and four annas per cow unit plus penning fee in major class of forests 440

8. The District Forest Officer is to submit a report to the Chief Conservator through the Conservator at the end of the five years about increasing the fees 441

9. The rotational grazing blocks of the year and the paddocks in them shall be demarcated in the first instance 442

10. The grazing year shall be from 1st of July to 30th June 443

11. The paddocks in each block shall be open to grazing in rotation, cattle being permitted to graze in one paddock at a time for a period of one month only and the paddock closed to grazing for the next two months, allowing the cattle to graze in the next paddock in sequence 444

12. If, in any paddock, the grass is not sufficient for grazing for the prescribed period of one month at a time, the next paddock in sequence in the block will be opened for grazing, provided the new paddock so opened, had remained closed to grazing for at least six weeks previously 445

13. The permissible grazing incidence for each paddock will be 6 acres per cow unit .. 446

14. The pen site in each paddock will be divided into two compartments and cattle stalled in each compartment alternately for fifteen days 448

15. Graziers will be allowed free the materials required for putting up sheds in the pens and fencing the pen compartments 449

16. The existing water sources in the pens shall be improved and new water facilities provided, where required 450

17. The villagers will be allowed the cutting and removal of fodder grass on head-loads, free of charge, from the reserved forests 451

18. A journal for each rotational grazing block will be maintained in the District Forest Office 452

CHAPTER X—WORKING PLAN FOR THE LAC WORKING CIRCLE.

1. Constitution—
The working circle comprises of selected blocks containing *Scheleichera trijuga* and *Zizyphus jujuba* trees in Aiyur, Gulhatti and Tholavubetta reserved forests. 457

2. The working circle will be divided into two cultivation series 458

3. Preparation of tree branches as a preliminary for the cultivation of lac described .. 459–460

4. Method of cultivation of lac : Habits of lac insects described 461–468

5. Infection of brood-lac is to be done in bundles of brood-lac at selected points .. 469

6. Removal of the stick lac : All brood-lac put on each tree should be removed and nothing should be missed out and left to remain on the tree on lie on the ground .. 470

7. Swarming of male lac insects and impregnation of female lac insects described .. 471

8. Formation of lac after impregnation of female lac insects described 472

9. Cracks appear on the encrustation when the lac crop matures which takes a drier appearance before two weeks before swarming and the appearance of yellow-orange spots on the female cells is indicative of " swarming " which generally commences about a week or ten days later 473

PARAGRAPH

10. The signs of impending swarming should be carefully watched for and the crop should be cut sufficiently long before the swarming takes place 474

11. Brood-lac not required for inoculation and stick lac removed from infected trees should not be stored but should be scraped and washed. Scraped lac should not be exposed to sun, ground in stone grinders and then soaked in water in ten to twelve hours and dried in shades 475

12. The washed lac is to be handed over to the Research Ranger at Denkanikota .. 476

13. All the branches of the host trees shall be so pruned as to produce shoots of uniform suitability 477

14. Instructions for carrying out pruning operations given 479

15. Injuries to which lac insects are liable are given 481

16. Lantana and other growth under the tree to be infected shall be removed and interfering branches of adjoining trees cut at least one month before infection is done.. 482

17. Woody branches resulting from pruning shall be removed to minimise the risk of fire. 483

18. All operations connected with the cultivation of lac shall be personally supervised by the Range Officer 484

19. Control—
A journal for each cultivation series shall be maintained 485

Chapter XI—Working plan for the Minor Forest Produce Working Circle.

1. Constitution—
This working circle includes all the reserved forests and unreserved forests of the division 486

2. The area of the reserved forests included in the working circle is 451,155 acres .. 487

3. The exploitation of tanning barks, dyeing bark, nux-vomica, soapnut, kadukai, deer and sambhur horns and honey and wax from unreserves is to be controlled by the District Forest Officer 489

4. Tamarind in the reserved forests on the Hosur plateau is to be sold in separate farms. 490

5. The minor forest produce, except ivory, deer horns and sambhur horns, is to be exploited through the agency of contractors 493

6. Ivory, deer horns and sambhur horns are to be collected departmentally 494

7. Tamarind in each farm-unit is to be sold in public auction with voidha for eight months from the 1st November to the 30th June 496

8. Konnai bark will be exploited on a five-year rotation each range including unreserves being treated as one lease unit, and will be sold in public auction with voidha for one-year from 1st July to 30th June 497, 498

9. Avaram bark, vembadam bark and nux-vomica will be leased out jointly every year in open auction, each range including unreserves forming one lease unit and the period of lease being one-year from 1st July to 30th June 499

10. All other minor forest produce in the reserved forests and kadukai and soap-nut in unreserves are to be grouped together and each unit sold every year separately in open auction with voidha for one year from 1st July to 30th June 500, 501

11. Green manure leaf in fuel coupes of Thoppur and Parigam felling series of Dharmapuri range and in Kumri areas in Nandibanda reserved forest of Krishnagiri range will be sold in public auction every year in May, with voidha for one year from the 1st June to 31st December, each range being treated as a separate lease unit .. 502

12. If, in any year, the manure leaf is not sold, permits will be issued for the removal of manure leaves at Rs. 1–4–0 per cart-load 503

13. Tamarind will be planted as avenue trees along the margins for forest roads in the division, on an annual programme to spread over all the ranges throughout the period of this working plan. Plants are to be raised in pits 50 feet apart, the spacing being so regulated that the pit on one side is not directly opposite to the pit on the other side 506

PARA-GRAPH

14. Record of statistics—
All lessees of minor forest produce is to submit regular accounts of removals of the various items of produce from their leased areas 507

15. Control—
A control book will be maintained 508

CHAPTER XII—WORKING PLAN FOR THE LANTANA CONTROL WORKING CIRCLE.

1. Constitution—
Selected blocks of dense lantana areas of 75 acres in extent in each of Gulhatti, Javalagiri and Ubrani reserved forests will form the Lantana Control Working Circle 512

2. The area in each of the reserved forests will form a planting series, each planting series consisting of 15 annual planting areas of 5 acres each 513

3. The method of treatment will be under planting the lantana area with the bamboo. 515

4. The annual area to be planted shall be demarcated with ten feet cut lines and should be provided with inspection paths dividing the entire area of five acres into two plots. Pits shall be dug in pits at an espacement of six feet by six feet under the lantana in May and two or three bamboo rhizomes of one year old planted in each of the pits on rainy days in June 516

5. The casualties shall be replaced on rainy days every month till October and, if necessary, this work will be done in second and third year also 517

6. Sign boards shall be put up at convenient corners of each plantation area 518

7. Control—
A control journal will be maintained 519

CHAPTER XIII—MISCELLANEOUS REGULATIONS.

1. Fire protection—
General fire protection operations will be confined to the annual clearance of all important foot-paths as well as the existing fire lines 523

2. The work of clearance shall be undertaken in December-January and completed before the end of January. In no case shall burning or fire tracing be done .. 524

3. The coupe boundaries are to be completely cleared to a width of fifteen feet 528

4. Roads and buildings—
All forest roads and bridle paths shall be kept in a state of repair 530

5. New roads will be constructed as prescribed 531, 532

6. All departmental buildings shall be kept in a state of repair 534

7. New buildings will be constructed as prescribed 535

8. Approved type designs must be adopted for all buildings 536

9. The existing wells shall be kept in a state of repair 539

10. The local beat subordinates shall clear and maintain all reserved forest boundaries .. 540

11. Rain-gauge—
Daily record of rainfall shall be kept at each of the rain-gauge stations which are to be in charge of Officers not lower in rank of a forester 541

12. Control—
The posting and maintenance of control records and maps should receive the personal attention of the District Forest Officer 542

13. Register of deviations shall be maintained 543

CHAPTER XIV—ESTABLISHMENT AND LABOUR.

1. Establishment—
The number of foresters to be employed in the Division will be reduced from 25 to 23 from 1st April 1950 .. .. 545, 546

2. One Forest Guard and one watcher will be employed for Thogarapalli and Thattakkal reserved forests, which will be constituted as a separate beat in Krishnagiri range .. 546

CHAPTER XV—FINANCIAL FORECAST.

1. The gross revenue anticipated during the period of this working plan is Rs. 82,69,490 against which the total expenditure is expected to be Rs. 24,94,340 leaving a surplus of Rs. 57,75,150. The average annual surplus will be Rs. 3,85,010 550

2. The cost of this working plan is Rs. 21,066 which works out to an expenditure of 10 pies per acre of the reserved forests dealt with 551

APPENDIX I.

List of Flora in North Salem Division.

Botanical name. (1)	*Tamil name.* (2)	*Kanarese name.* (3)
Abrus precatorius	Kunrimani	Gulaganji.
Acacia arabica	Karuvelam	Gobbali.
Acacia concinna	Siyakayi	Sigaiballi.
Acacia farnesiana	Kadivel	Kasturigobbali.
Acacia ferruginea	Vanni, Parambamaram	Banni.
Acacia intsia	Indu	Antarike.
Acacia latronum	Anaimullu	Ottejali (Ottegobbuli).
Acacia leucophlœa	Velvelam	Navibela.
Acacia pennata	Kari Indu	Kadusege.
Acacia planifrons	Kudaivel.	Odajalli.
Acacia suma	Celai	Mugala.
Acacia sundra	Karungali	Kachu.
Acalypha fruticosa	Cinni	Cinni.
Adenarthera pavonina	Anaikkunrimani	Manjadi.
Adhatoda vasica	Adadodai	Adusoge.
Adina cordifolia	Manjakadambai	Kadambe, Arasinatheg.
Aegle marmelos	Vilvam	Bilvapatre.
Agave americana	Anaikkaralai	Kalnaru.
Ailanthus excelsa	Pimaram	Peetherai.
Alangium lamarckii	Azinjal	Ankola.
Albizzia amara	Thurunji	Sujjal.
Albizzia lebbeck	Vagai, Katuvujai	Bagai.
Albizzia odoratissima	Bilwaram	Kadubage.
Albizzia procera	Nallavagai or Velvagai	Salvagai.
Albizzia stipulata	Pilivagai	Bettabage.
Aloe officinalis	Karralai	Raktabala.
Allophylus cobbe	Perrakudikai	Sidisale.
Alstonia scholaris	Elaipalai	Jantrapala.
Aprosa lindleyana	....	....
Amoora rohituka	Vengul	Mullnuttaga.
Antidesma diandrum	Gurrapujalli	Mryjinakodusoppes.
Anacardium occidentale	Mundriparapumaram	Gerubeejadamara.
Anogeissus latifolia	Namai	Bejjal.
Anona squamosa	Sithapalam	Sitapala.
Argyrea cuneata	....	Nettaruhu.
Argyreia pomacea	....	....
Aristolochia indica	Ivavari	Isvaraberu.
Artocarpus integrifolia	Palavu	Halasu.
Asparagus racemosus	Cadamulam	Aheruballi.
Atalantia monophylla	Kattellumichai.	Katimbai.
Atylosia candollei	Kattuthuvarai	Kadutoagre.
Azadirachta indica	Veppam	Bevina maram.
Balanites roxburghii	Toruvattu	Ingalukke.
Balsamodendron berryi	Mul Kiluvai	Iyhalli.
Bambusa arundinacea	Perumoongal	Biduru.
Bambusa longifolia	....	Seemaibidiru.
Barleria buxifolia	Kattimullu	Gandikotimullu.
Bassia latifolia	Kattulilippe	Alippe.
Bassia longifolia	Nattilippai	Sannayippe.
Bauhinia malabarica	Mandarai	Mandara.
Bauhinia racemosa	Athi	Arulakadumandara.
Bauhinia vahlii	Mandaraiyilai	Anepadu.
Berberis nepalensis	Mullukadambu	Tarike.
Bombax malabaricum	Mulelavam	Burga.
Borassus flabellifer	Karambanai	Panai.
Boswellia serrata	Kungiliam	Dhupadamara.
Bridelia retusa	Mullu Vengai	Komanjee.
Buchanania latifolia	Sarai	Murki.
Butea frondosa	Palasu	Muthuga.
Butea superba	....	Muttuginaballi.
Caesalpinia mimosoides	Pulinakkagonrai	Gaijjigaballi.
Calotropis gigantea	Yerikkan	Ekka.
Canthium didymum	Nekkini	Pyre.
Canthium parviflorum	Karai	Karai.
Capparis divaricata	Ambaramavalli	Totte.
Capparis grandiflora	Turratumullu	Tothemullu.
Capparis horrida	Adondai	....
Capparis sepiaria	Thoratti	Kathiramullu.
Capparis spinosa	....	Muttukallari.
Careya arborea	Ayma	Kaval.

Botanical name. (1)	*Tamil name.* (2)	*Kanarese name.* (3)
Carissa carandas	Kilakkai	Kauligida.
Carissa paucinervia	....	....
Carissa spinaram	Sirumkilakkai	Cikkakavali.
Caryota urens	Kundalpanaimaram	Byne maram.
Cassia auriculata	Avaram	Avarikka.
Cassia fistula	Konnai	Kakke.
Cassia glauca	Thakarai	Betadavare.
Cassia montana	Malaiyavaram	Malayavarike.
Cassia tora	Thakarai	Tagaee.
Cassia siamea	Ponavaram	Pomavarai.
Casuarina equisetifolia	Savukku (Chowk)	Kesarike (Chowka).
Cedrela toona	Kalkilanji	Gandha garige.
Celastrus paniculata	Manjakadi	Gavanagorge.
Celtis wightii	Vakkanai	Gorukallu.
Chloroxylon swietenia	Porasu	Urugil.
Cinnamomum zeylanicum	....	....
Cipadessa fruticosa	Cevvattai	Adusoge.
Citrus aurantium	Narangam	Naranga.
Citrus medica. acids	Elumichipalam	Nimbehuli.
Cirtus medica laneeka	....	Imbe.
Clausena willdenovii	Kattukkariveppilai	....
Clerodendron infortunatum	....	Peruku.
Cochlospermum gossypium	Kongelavam	Kaduburga.
Coffea arabica	Kappi	Kappi.
Cordia monoica	Salle	Narivalli.
Cordia myxa	Naruvili	Cikkacalle.
Crotalaria laburnifolia	Kiluguppi.	....
Crotalaria pulcherrima	Kilugiluppai	....
Crotalaria retusa		....
Cryptostegia grandflora	....	....
Dalbergia latifolia	Eti, Tawadi	Beedi.
Dalbergia paniculata	Pachalam	Bilugadamaram.
Dalbergia sissoo	Itti	Agara.
Datura stramonium	Umattai	Dattara.
Decalepis hamiltonii		....
Dendrocalamus strictus	Kalmoongil	Biduru.
Derris scandens	Anaikellikodi	Handiballi.
Desmodium pulchellum		Jenukagaddi.
Desmodium gyrans	Toluganni	Nagatahare.
Dichrostachys cinerea	Vedathalam	Odavara.
Diospyros melanoxylon	Karumthumbi	Thoopra.
Diospyros montana	Vakkanai	Bukkana.
Dioscorea oppositifolia	Verrilaivalli	Nirballe.
Dodonæa viscosa	Vilari	Hongar.
Dolichondrone arculata	Irappalai	Kadunirudure.
Ehretia buxifolia	Kattuvellilai	Bute.
Elæagnus latifolia	Kalugi	Hittele.
Elæodendron glaucum	Kanniramaram	Mukkuruchimaram.
Elæodendron serratum	....	....
Elettaria cardamomum	Elakkayi	Elakki.
Erythrina indica	Kalajana murikku	Halivana.
Erythrina suberosa		....
Erythroxylon monogynum	Sembulichan	Kemanchi.
Eucalyptus		....
Eugenia jambolana	Nagamaram	Neeram.
Eugenia trifoliata	....	....
Euphorbia antiquorum	Tirugukalli	Mundukalli.
Euphorbia triucalli	Tirucalli	Bottugalli.
Feronia elephantum	Vellam	Beladamaram.
Ficus arnottiana	Kodiyaracu.	Kadarase.
Ficus bengalensis	Ala	Aladamaram.
Ficus benjamina (Javafig)	....	....
Ficus gibbosa	Alrananji	Goddumitle.
Ficus glomerata	Athi	Athi.
Ficus mysorensis	Kallala	Attakegoli.
Ficus religiosa	Arasa	Aroli.
Ficus retusa	Icci	Hillala.
Ficus tjakela	Kallal	Basari.
Ficus tomentosa	Kalathi	Kadugoni.
Flacourtia ramontchi	Chothakilai	Gajale.
Flacourtia sepiaria	Cottaikkala	Mirde.
Flueggea leucopyrus	Irubulai	Bilehuli.
Flueggea microcarpa	Pula.	Bilisuli.
Gardenia gummi fera	Kambili pissin	Kalkambi.
Gardenia latifolia	Kambil	Adavibikke.

Botanical name. (1)	*Tamil name.* (2)	*Kanarese name.* (3)
Garuga pinnata	Arunelli	Aranelli.
Givotia rottleriformis	Buthalai	Bettathavarai.
Glycosmis pentaphylla	Anam	Guruvade.
Gmelina arborea	Kumil	Kulimavu.
Gmelina asiatica	Kumilan	Goola mara.
Grevilla robusta	Seemechowk	Silver oak.
Grewia asiatica	Palica	Buttiyudippe.
Grewia hirsuta	Tavidu	Cikkudippe.
Grewia lævigata	Naraithai, Poonaipuduku	Javanigalle.
Grewia tiliæfolia	Thadasal	Buttele.
Gyrocarpus jacquini	Thanakku	Thanakku.
Hardwickia binata	Achan	Karachu.
Helicteres isora	Valambiri	....
Hemidesmus indicus	Nannari	Namadaberu.
Heptapleurum wallichianum	....	Beddhele.
Hibiscus rosaswensis	Chembaruthi	Dasavala.
Hibiscus lampas	Kattuparuthi	Turuve.
Hypericum mysorense	....	....
Hiptage madablota	Kalarai	Pikigisam
Holarrhena antidusenterica	Erukkalaippalai	Kodamuriky.
Holigarna arnottiana	Karuncarai	Kologeru.
Holoptelea integrifolia	Aya	Thogala.
Hydnocarpus wightiana	Maravatti	....
Ichnocarpus frutescens	Udargodi	Karihambu.
Indigofera mysorensis	....	....
Indigofera tinctoria	Nili	Nili.
Ixora parviflora	Korivi	Goravi.
Jasminum angustifolium	Kattumalligai	Kodummalligai
Jasminum arborescens	Nagamalli	Doddakadumalligai.
Jasminum rigidum	Ucimalligai	Adaviyamalla.
Jatropha curcas	Kattamanakku	Ucharale.
Jatropha glandulifera	Adalai	Totta.
Kydia calycina	Vendai	Bende.
Lagerstroemia thomsoni	....	....
Lantana (*species*)	Arippu	Jidde.
Lawsonia alba	Aivanam	Goranta.
Leucas aspera	Thumbai	Thumbe.
Limonia acidissima	Magavilvam	Kadubela.
Linociera malabarica	Porumbolu	Hariyage.
Litsœa (species)	....	....
Loranthus	Morottai	Benjai.
Loranthus longiflorus	Pullurivi	Bandanike.
Maba buxifolia	Irumbali	Karuganai.
Mallotus phillipinensis	Kamala	Kesal.
Mangifera indica	Mamaram	Mavinamaram.
Melia dubia	Mala vembu	Malabevinamaram.
Melia composita	Malavambu	....
Memecylon angustifolium	Vellaikkaya	Belavakkana.
Memecylon edule	Kayala	Ollekodi.
Memecylon gracile	Ucikkaca	....
Michelia champaca	Chambagam	Sampiga.
Mimosa pudica	Thottachurungi	Thoottutheramum.
Mimusops hexandra	Ulakkaipalai	Bakula.
Mimusops elengi	Magil	Mugule.
Morinda tinctoria	Manjavattai	Kadukumla.
Moringa concanensis	Muringai	Nagge.
Mundulea suberosa	Kodupparacu	Bethahuruli.
Murraya oxotica	Kattukariveppilai	Karibevu.
Murraya koenigii	Kariveppilai	Karibevu.
Nermim odroum	Arli	....
Ocimum sanctum	Tulasi	Kalatulasi.
Ochna squarrosa	Kalkuruvi	....
Odina wodier	Anaikkarai	Ajasryngi.
Olea dioica	Idalai	Edala.
Olea glandulifera	Kunde	Kunde.
Opuntia dillenii	Sapathi Kalli	Pappas kalli.
Pandanus	Thalai	Thalai.
Parkinsonia aculeata	Kathumasamuringai	....
Pavetta indica	Pavattai	Pavatta.
Phoenix acaulis	Icham	Ichida.
Phœnix sylvestris	Incu	Icalu.
Phyllanthus emblica	Nelli	Nelli.
Phyllanthus polyphyllus	Kilunelli	Manakkanni.
Phyllanthus reticulatus	Karunelli	Karesuli.
Pithecolobium dulce	Kodakapuli	....

Botanical name. (1)	Tamil name. (2)	Kanarese name. (3)
Pittosporum floribundum	Kattu sampangi	Tammatta.
Plumbago zeylanica	Cittramulam	Vahni.
Poinciana regia	Peddaturayi	Kattikayi.
Poinciana elata	Vadanarayanan	Sunkesari.
Polyalthia cerasoides	Kodigilai	Habbe.
Polyalthia longifolia	Acogim	Pungu.
Pongamia glabra	Punga maram	Punghai.
Premna tomentosa	Kolakkallai Thekku	Gupsiva.
Protium caudatum	....	....
Psidium guyava	Villakkoyya	Jamphalla.
Pterocarpus marsupium	Vengai	Honne.
Pterolobium indicum	Indu	Sundai mullu.
Randia dumetorum	Attadi Karai	Maggarai.
Ricinus communis	Amanakku	Avudala.
Saccoptalum tomentosum	Periyuvay	Heccara.
Santalum album	Santhanam	Gandadamaram.
Sapindus emarginata	Puchi	Pucha kattai.
Sarcostemma brevistigma	Kodikalli	Samballi.
Schleichera trijuga	Puvam, Puvatti.	Chakti.
Schrebera swietenioides	Magalingam	Gaute.
Scutia indica	Kakkamullu	Kuradi.
Scutia oppositifolia	....	Uli.
Semecarpus anacardium	Serangottai	Gurumara.
Shorea talura	Jalari maram	Jalada maram.
Sida acuta	Arivalamanaippundu	Bhimankaddi.
Solanum indicum	Naymulli	Gulla.
Solanum pubescens	Sundai	Sonde.
Solanum verbacifolium	Mullikai	Kadusondi.
Soymida febrifuga	....	Some.
Spondias mangifera	Kattu mavu	Ambatta.
Stephegyne parvifolia	Nirkadambe	Nayekadambe.
Sterculia alata	Anaittondi	....
Sterculia urens	Cendalai	Kempudaili.
Sterculia villosa	Anainar	Bilidaili.
Stereospermum chelonoides	Pathiri	Pathiri.
Stereospermum xylopyra	Manakombu	Hamrulave.
Streblus asper	Kurripila	Mitala.
Strobilanthus	....	Guriyi.
Strychnos nux-vomica	Sittimaram	Kasan.
Strychnos potatorum	Tettanmaram	Chittadamaram.
Tamarindus indica	Puliyamaram	Hunasemaram.
Tectona grandis	Theku	Thekinmaram
Tephrosia purpurea	Kattikkolunchi	Eampli.
Terminalia arjuna	Mathi	Billimaddi.
Terminalia belerica	Thani	Thare.
Terminalia chebula	Kadukkai	Anili.
Terminalia paniculata	Pillamaradu, Puluvai	Hongalu.
Terminalia tomentosa	Karimarudu	Karimaddi.
Thespesia populnea	Puvarasu	Havarasi.
Thevetia nerrifolia	Thiruvachippu	....
Toddalia aculeata	Kattu mulugu, Mullagaranai	Mullumastige.
Trema orientalis	Amathalai	Kadubaja.
Vangueria spinosa	Manakkarai	Accuramullu.
Ventilogo madaraspatana	Vembadam	Pappali.
Vitex altissima	Mayiladi	Navuladimara.
Vitex negundo	Nochi	Lakkigida.
Vitex pubscens	Mayila	Poradele.
Vitis quadrangularis	Pirandai	Sanduballi.
Webera corymbosa	Kodilin	Charanile.
Wedlandia notoniana	Kadambam	Betta Kammagaggara.
Wendlandia tinctoria	....	Torani.
Wrightia tinctoria	Palai	Ala mara.
Wrightia tomentosa	Tondambalai	Kaduveppale.
Zizyphus jujuba	Elandai	Else.
Zizyphus œnoplia	Chooraimullu	Paragi.
Zizyphus rugosa	Kattilandai	Kottamullu.
Zizyphus trinervia	Karukattan	Karukkattaimare.
Zizyphus xylopyrus	Kottai	Gotti.

APPENDIX II.

AVERAGE RAINFALL INCHES—NORTH SALEM DIVISION—FROM 1933 TO 1947.

Name of station.	*Authority maintaining the station.*	*Year.*	*January.*	*February.*	*March.*	*April.*	*May.*	*June*	*July.*	*August*	*September.*	*October.*	*November.*	*December.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Denkanikota	Deputy Tahsildar	1933	Nil.	Nil.	0·09	3·36	9·33	0·36	2·17	5·27	5·21	8·42	0·31	2·06	36.58
		1934	1·37	Nil.	Nil.	1·54	4·68	1·82	1·36	0·33	0·54	9·27	3·95	0·03	24·89
		1935	1·00	Nil.	Nil.	2·07	2·20	1·47	0·92	5·61	3·42	4·31	1·80	0·70	23·50
		1936	Nil.	1·29	Nil.	1·06	5·46	2·30	4·16	2·61	9·52	2·91	5·87	Nil.	35·18
		1937	0·18	0·95	1·16	9·19	10·30	3·25	1·95	4·47	6·43	7·22	3·57	0·70	49·37
		1938	Nil.	0·11	0·41	0·34	6·08	1·08	4·17	9·89	0·22	Nil.	0·33	0·11	22·74
		1939	0·29	Nil.	2·72	6·21	6·33	2·13	0·89	1·38	14·12	12·13	3·26	Nil.	49·46
		1940	Nil.	Nil.	0·44	5·76	6·53	0·65	1·90	3·17	3·74	6·13	9·36	0·72	38·40
		1941	0·64	Nil.	Nil.	0·27	3·37	0·27	2·61	6·62	3·70	2·50	2·69	4·31	26·98
		1942	Nil.	Nil.	Nil.	1·07	6·23	2·89	0·34	5·83	4·51	10·62	1·51	2·15	35·15
		1943	1·28	0·33	0·84	2·59	7·99	0·55	2·29	1·95	6·99	14·44	0·99	Nil.	40·24
		1944	Nil.	4·18	2·71	0·82	1·53	1·78	0·52	3·57	11·35	2·33	4·75	1·36	34·90
		1945	Nil.	Nil.	Nil.	2·26	3·38	1·10	3·86	4·92	1·43	2·09	2·63	Nil.	21·67
		1946	0·21	Nil.	0·63	2·40	4·96	1.33	2·23	3·60	7·60	16·39	10·68	Nil.	50·03
		1947	0·52	Nil.	Nil.	Nil.	1·20	3·81	Nil.	10·42	3·54	9·12	0·91	0·54	30·06
	Total ..		5·49	6·86	9·00	38·94	79·57	24·79	29·37	69·64	82·32	107·88	52·61	12·68	519·15
	Average ..		0·37	0·46	0·60	2·60	5·30	1·65	1·96	4·64	5·49	7·19	3·51	0·85	34·61
Javalagiri	Forester	1933	Nil.	Nil.	Nil.	1·89	9·25	1·53	3·88	7·73	3·12	5·71	0·03	3·75	36·89
		1934	1·18	Nil.	Nil.	2·42	4·12	2·81	2·65	1·06	1·44	10·43	1·86	0·20	28·17
		1935	0·29	Nil.	Nil.	2·59	3·78	1·92	2·92	8·54	5·41	9·15	1·54	0·48	36·62
		1936	Nil.	0·66	1·45	1·46	4·72	7·87	5·51	4·45	8·31	1·46	3·99	Nil.	39·88
		1937	Nil.	Nil.	0·91	9·81	7·55	3·44	4·23	4·93	4·34	7·58	1·84	0·47	45·10
		1938	Nil.	0·87	Nil.	0·42	5·09	1·23	3·27	14·33	Nil.	0·45	1·00	Nil.	26·66
		1939	0·15	Nil.	2·51	4·85	3·09	6·03	0·97	1·37	7·76	9·06	3·83	Nil.	38·62
		1940	Nil.	Nil.	0·29	6·69	7·65	3·13	5·12	7·21	2·16	9·66	4·71	0·48	47·10
		1941	Nil.	Nil.	Nil.	4·76	3·09	2·42	2·58	5·31	4·86	5·10	2·00	4·57	34·69
		1942	Nil.	Nil.	Nil.	0·68	2·73	7·10	1·58	7·68	6·14	10·80	1·20	2·33	40·24
		1943	0·83	0·30	0·60	5·33	12·00	1·00	2·89	4·83	9·42	16·56	0·48	Nil.	54·24
		1944	Nil.	2·00	3·32	3·37	4·70	0·65	0·80	6·48	9·06	3·69	2·71	0·55	37·33
		1945	Nil.	Nil.	Nil.	1·80	4·07	2·95	5·60	6·75	1·70	4·78	2·27	Nil.	29·92
		1946	Nil.	Nil.	2·00	1·94	6·245	2·24	5·20	5·88	12·31	9·39	4·76	9·185	59·15
		1947	Nil.	Nil.	Nil.	Nil.	3·40	1·20	1·00	10·75	2·50	6·91	0·62	Nil.	26·38
	Total ..		2·45	3·83	11·08	48·01	81·485	45·52	48·20	97·30	78·53	110·73	31·84	22·015	580·99
	Average ..		0·16	0·26	0·74	3·20	5·43	3·03	3·21	6·49	5·24	7·38	2·12	1·47	38·73

Devarabetta	Forester	1933	Nil.	0·22	Nil.	0·47	9·73	1·36	5·60	5·49	2·93	5·78	Nil.	5·25	36·83
		1934	0·56	Nil.	Nil.	1·99	4·83	2·99	2·28	1·90	0·42	8·63	2·08	Nil.	25·68
		1935	Nil.	Nil.	Nil.	5·24	2·35	2·95	0·98	9·27	3·43	6·91	0·72	1·00	32·85
		1936	Nil.	0·12	0·96	1·50	6·79	6·04	10·20	2·38	7·84	3·35	4·12	Nil.	43·30
		1937	Nil.	0·88	0·25	5·21	4·22	1·94	5·18	4·31	6·48	6·82	3·54	0·56	39·39
		1938	Nil.	0·60	0·90	0·10	4·94	0·93	3·48	11·13	8·82	1·86	0·89	Nil.	33·65
		1939	0·24	Nil.	2·24	4·98	4·17	3·75	1·65	1·82	9·47	9·82	2·22	Nil.	40·36
		1940	Nil.	Nil.	Nil.	2·91	8·15	4·40	3·05	5·31	2·97	5·76	4·57	0·43	37·55
		1941	0·17	Nil.	Nil.	3·37	2·13	1·79	3·90	4·20	8·90	5·90	0·21	3·76	35·33
		1942	Nil.	Nil.	Nil.	0·60	4·64	2·07	1·73	8·13	6·93	6·01	1·97	0·80	32·88
		1943	0·60	Nil.	0·60	3·35	8·70	0·22	3·68	5·09	10·80	15·31	0·92	Nil.	49·27
		1944	Nil.	1·20	6·80	1·30	2·50	1·55	1·64	7·25	6·30	1·64	4·33	9·72	35·23
		1945	Nil.	Nil.	0·50	0·50	5·32	0·76	5·97	7·43	1·21	4·84	1·60	Nil.	28·13
		1946	Nil.	Nil.	0·59	2·94	9·14	0·92	6·58	Nil.	Nil.	Nil.	Nil.	9·10	29·27
		1947	Nil.	Nil.	1·20	1·60	Nil.	1·00	8·90	Nil.	5·84	11·74	2·65	Nil.	32·93
	Total ..		1·57	3·02	14·04	36·06	77·61	32·67	64·82	73·71	82·34	94·37	29·82	21·62	531·65
	Average ..		0·10	0·20	0·94	2·40	5·17	2·18	4·32	4·91	5·49	6·29	1·99	1·44	35·44
Marandahalli	....	1935	1·53	Nil.	Nil.	1·02	3·25	4·21	0·30	6·52	5·82	3·85	2·33	0·77	29·60
		1936	Nil.	0·76	0·28	0·99	5·43	0·16	1·38	0·64	9·38	3·84	6·40	0·85	30·11
		1937	0·05	Nil.	0·15	2·65	7·05	3·40	0·58	5·54	7·70	10·82	3·42	0·72	42·08
		1938	Nil.	Nil.	0·20	0·10	8·17	1·35	4·20	9·03	1·58	1·45	0·29	0·05	27·42
		1939	0·35	Nil.	1·87	11·53	8·54	4·42	0·80	3·83	6·83	20·26	10·13	0·05	68·61
		1940	Nil.	Nil.	1·28	7·40	15·40	4·42	0·56	1·40	10·48	3·56	12·69	2·10	59·09
		1941	1·60	Nil.	Nil.	0·45	7·65	0·70	9·07	8·06	13·15	3·37	2·81	6·71	53·57
		1942	Nil.	Nil.	Nil.	2·40	8·91	4·20	0·25	13·24	11·86	10·09	1·38	1·30	53·63
		1943	1·92	0·75	Nil.	9·50	8·80	0·04	1·51	1·65	6·00	29·24	1·71	0·62	61·74
		1944	0·02	5·33	2·39	1·15	4·71	8·72	2·41	9·21	10·58	11·58	8·35	1·46	65·91
		1945	Nil.	Nil.	2·36	7·90	1·03	3·89	Nil.	4·87	0·15	13·40	5·61	0·86	40·17
		1946	0·27	Nil.	2·39	3·82	8·26	0·44	0·61	4·96	16·69	12·17	14·10	9·10	72·81
		1947	1·01	Nil.	Nil.	Nil.	Nil.	1·97	1·92	6·65	2·25	8·41	2·50	0·50	25·21
	Total ..		6·75	6·84	10·92	48·91	87·20	37·72	23·59	75·60	102·47	132·04	71·72	25·19	628·95
	Average ..		0·52	0·53	0·84	3·76	6·71	2·90	1·81	5·82	7·88	10·16	5·52	1·94	48·38
Pennagaram	Deputy Tahsildar	1935	0·47	Nil.	Nil.	1·36	2·17	5·01	2·03	5·52	6·26	7·90	3·94	0·53	35·19
		1936	Nil.	1·39	1·76	1·98	6·33	2·14	6·22	0·68	5·66	1·62	8·16	0·42	36·36
		1937	Nil.	0·29	0·44	3·07	3·97	5·27	1·74	0·01	5·15	3·94	1·91	0·28	26·07
		1938	Nil.	Nil.	0·05	0·09	3·73	0·53	3·99	8·59	3·98	0·95	0·33	0·26	22·50
		1939	0·08	Nil.	1·13	4·06	4·68	4·51	0·30	2·74	8·93	10·15	2·23	Nil.	38·81
		1940	Nil.	Nil.	1·55	2·76	11·98	5·00	0·80	1·11	5·81	3·99	5·03	0·65	38·68
		1941	Nil.	Nil.	Nil.	0·36	7·30	0·53	3·10	3·77	10·33	4·42	3·99	4·03	37·83
		1942	Nil.	Nil.	Nil.	5·14	3·27	3·32	0·15	7·36	6·25	9·88	0·50	1·98	37·85
		1943	Nil.	0·48	0·21	3·80	6·63	1·68	1·59	1·18	5·96	16·07	0·70	Nil.	38·30
		1944	Nil.	2·00	5·62	2·55	2·16	5·51	2·15	4·86	3·69	4·63	3·48	1·26	42·90
		1945	Nil.	Nil.	Nil.	2·39	1·49	2·73	2·57	5·36	0·82	3·38	1·94	0·78	21·46
		1946	0·49	Nil.	1·33	3·12	2·76	2·01	0·89	2·84	8·27	10·40	16·64	10·29	60·04
		1947	1·18	Nil.	Nil.	Nil.	4·96	6·97	4·52	7·63	9·49	11·49	0·34	0·22	46·80
	Total ..		2·22	4·16	12·09	30·68	62·43	45·21	30·05	51·65	85·60	88·81	49·19	20·70	482·79
	Average ..		0·17	0·32	0·93	2·36	4·80	3·48	2·31	3·97	6·58	6·83	3·78	1·59	37·14

APPENDIX II—*cont.*

AVERAGE RAINFALL INCHES—NORTH SALEM DIVISION—FROM 1933 TO 1947—*cont.*

Name of station.	*Authority maintaining the station.*	*Year.*	*January.*	*February.*	*March.*	*April.*	*May.*	*June.*	*July.*	*August.*	*September.*	*October.*	*November.*	*December.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Aitur	Forester	1935	2·00	0·70	Nil.	3·40	5·20	1·80	0·80	6·20	4·00	7·40	2·20	1·20	34·90
		1936	Nil.	2·00	1·60	1·00	9·10	2·70	3·70	3·20	4·50	0·70	7·70	0·50	36·70
		1937	Nil.	0·30	0·40	8·80	7·00	2·80	2·20	3·60	5·30	10·60	4·20	0·80	46·00
		1938	Nil.	0·30	0·60	1·60	6·55	0·40	5·90	12·65	1·70	0·90	0·80	Nil.	31·40
		1939	0·40	Nil.	3·00	9·00	4·40	2·20	1·65	3·00	6·10	13·40	5·40	Nil.	48·55
		1940	Nil.	Nil.	1·80	0·90	6·10	4·40	1·40	1·80	7·30	6·00	10·00	1·20	40·90
		1941	0·20	Nil.	Nil.	1·30	4·40	0·40	2·20	4·60	5·50	2·40	3·40	4·80	29·20
		1942	Nil.	Nil.	Nil.	2·00	3·80	2·90	1·40	9·60	4·30	10·50	4·80	3·10	42·40
		1943	2·00	1·20	0·20	3·40	7·80	Nil.	3·50	2·80	7·10	19·50	2·20	Nil.	49·70
		1944	Nil.	4·00	5·30	0·30	2·60	1·30	1·40	3·60	11·30	6·40	8·20	2·10	46·50
		1945	Nil.	Nil.	Nil.	1·40	5·10	7·10	4·30	7·80	Nil.	5·90	3·00	Nil.	34·60
		1946	0·80	Nil.	Nil.	4·20	9·90	2·00	1·30	4·10	12·80	6·20	11·60	8·60	61·50
		1947	0·40	Nil.	0·70	1·50	4·10	6·20	9·70	21·70	Nil.	8·40	Nil.	1·70	54·40
	Total ..		5·80	8·50	13·60	38·80	76·05	34·20	39·45	84·65	69·90	98·03	63·50	24·00	556·75
	Average ..		0·45	0·65	1·05	2·98	5·85	2·63	3·03	6·51	5·38	7·56	4·88	1·85	42·83
Anchetti	Range Officer	1935	0·10	Nil.	0·40	3·00	3·80	Nil.	2.80	7·60	3·00	7·40	0·80	1·40	30·30
		1936	Nil.	1·20	1·00	3·70	6·55	2·40	5·11	2·00	12·10	1·60	5·70	0·20	41·56
		1937	Nil.	0·30	1·55	7·80	5·75	3·90	1·80	4·35	5·10	5·60	0·90	0·40	37·45
		1938	Nil.	Nil.	Nil.	1·10	7·00	0·60	2·70	14·40	2·20	Nil.	1·80	0·60	30·40
		1939	0·60	Nil.	3·20	4·40	7·00	2·30	2·00	2·20	6·20	10·40	1·60	Nil.	39·90
		1940	Nil.	Nil.	0·40	1·40	5·80	1·00	1·36	4·00	2·20	6·20	4·60	Nil.	26·90
		1941	0·60	Nil.	Nil.	3·00	5·60	2·00	2·80	3·60	6·20	2·40	1·22	2·30	29·72
		1942	Nil.	Nil.	Nil.	3·90	6·00	2·57	Nil.	6·40	4·00	10·68	Nil.	4·00	37·55
		1943	Nil.	1·10	Nil.	4·00	6·70	Nil.	Nil.	2·00	7·00	12·60	Nil.	Nil.	33·40
		1944	Nil.	3·60	7·40	0·20	1·60	0·80	1·83	4·20	6·80	2·20	4·60	Nil.	33·23
		1945	Nil.	Nil.	Nil.	2·80	1·20	2·40	3·80	7·90	Nil.	5·80	2·00		25·90
		1946	Nil.	Nil.	1·30	2·50	7·50	2·30	Nil.	5·40	Nil.	5·60	5·80	Nil.	30·40
		1947	Nil.	Nil.	Nil.	Nil.	2·80	Nil.	Nil.	Nil.	2·80	10·00	Nil.	Nil.	15·60
	Total ..		1·30	6·20	15·25	37·80	67·30	20·27	24·14	64·05	57·60	80·48	29·02	8·90	412·31
	Average ..		0·10	0·48	1·17	2·91	5·18	1·57	1·86	4·93	4·43	6·19	2·23	0·68	31·72
Thoppur	Village Munsif	1939	0·11	Nil.	0·55	3·55	1·85	6·34	Nil.	1·58	4·45	9·54	3·55	Nil.	31·52
		1940	Nil.	Nil.	Nil.	1·90	11·86	2·01	2·73	1·40	2·66	4·34	1·90	Nil.	28·80
		1941	Nil.	Nil.	Nil.	0·90	6·14	0·67	1·17	0·85	8·83	0·61	2·54	4·62	26·33
		1942	Nil.	Nil.	Nil.	4·49	2·87	2·71	1·26	7·30	5·68	4·57	0·70	0·72	30·30
		1943	2·07	0·30	1·60	3·66	8·21	1·56	1·73	2·60	5·03	9·32	1·40	Nil.	37·48
		1944	Nil.	1·75	6·50	0·72	4·39	1·39	2·46	3·37	6·81	6·64	5·44	1·07	40·54

	1945	Nil.	Nil.	Nil.	2·99	0·56	1·65	2·34	7·81	3·28	7·18	Nil.	Nil.	25·81
	1946	0·44	Nil.	2·09	2·20	6·44	5·65	2·66	4·39	6·54	8·49	12·09	5·51	56·50
	1947	Nil.	Nil.	1·30	Nil.	Nil.	0·72	1·82	3·87	3·13	5·90	7·16	3·20	27·10
Total ..		2·62	2·05	12·04	20·41	42·32	22·70	16·17	33·17	46·41	56·59	34·78	15·12	304·18
Average ..		0·29	0·23	1·34	2·27	4·70	2·52	1·90	3·69	5·16	6·29	3·86	1·68	33·82
Krishnagiri	1936	Nil.	1·46	0·35	0·38	4·21	1·53	2·16	0·42	7·75	5·19	6·78	1·18	31·41
	1937	Nil.	1·65	2·56	8·31	7·02	2·51	1·82	3·16	3·13	5·42	4·62	0·37	40·51
	1938	Nil.	Nil.	0·60	1·39	4·95	1·49	0·09	9·22	7·08	1·19	1·17	Nil.	36·18
	1939	0·49	Nil.	0·97	9·61	4·26	3·13	0·61	1·65	9·42	10·24	2·70	Nil.	43·08
	1940	Nil.	Nil.	0·45	3·12	7·69	4·22	0·18	1·31	4·90	5·76	4·33	0·60	32·56
	1941	0·88	Nil.	Nil.	Nil.	8·11	0·89	1·67	2·75	9·03	1·97	1·98	3·71	30·99
	1942	Nil.	Nil.	Nil.	1·50	6·38	3·84	0·13	6·35	3·31	4·81	1·03	3·53	30·88
	1943	1·19	0·19	Nil.	3·46	7·28	0·30	1·77	1·47	5·98	14·91	0·82	Nil.	37·37
	1944	Nil.	1·02	3·97	1·56	1·56	1·73	3·58	10·80	7·83	3·26	3·02	1·20	39·53
	1945	Nil.	Nil.	Nil.	0·76	6·87	0·12	1·88	6·41	1·02	4·47	Nil.	Nil.	21·53
	1946	0·49	Nil.	0·29	1·29	4·29	0·20	1·15	1·47	11·86	7·73	6·97	5·44	41·18
	1947	0·37	0·03	0·04	Nil.	Nil.	8·07	7·91	8·61	3·53	6·49	2·27	Nil.	37·32
Total ..		3·42	4·35	9·23	31·38	62·62	28·03	31·95	53·62	74·84	71·44	35·69	16·03	422·60
Average ..		0·29	0·36	0·77	2·62	5·22	2·34	2·66	4·47	6·24	5·95	2·97	1·34	35·22
Medugampalli	1943	Nil.	Nil.	Nil.	5·91	5·80	Nil.	2·71	1·78	7·63	13·78	1·46	Nil.	39·07
	1944	Nil.	1·14	2·20	2·02	1·00	2·16	4·72	6·05	5·16	4·20	1·94	0·77	31·36
	1945	Nil.	Nil.	Nil.	1·16	3·96	0·05	1·50	6·75	1·61	3·80	0·25	Nil.	19·08
	1946	Nil.	Nil.	0·50	1·10	2·33	Nil.	Nil.	0·80	6·84	5·42	3·10	3·65	23·74
	1947	Nil.	Nil.	Nil.	1·20	Nil.	1·65	5·85	Nil.	4·40	9·55	0·60	Nil.	23·25
Total ..		Nil.	1·14	2·70	11·39	13·09	3·86	14·78	15·38	25·64	36·75	7·35	4·42	136·50
Average ..		Nil.	0·23	0·54	2·28	2·62	0·77	2·96	2·08	5·13	7·35	1·47	0·88	27·30
Biligundlu	1942	Nil.	Nil.	Nil.	3·54	1·99	1·80	Nil.	3·50	1·90	5·65	1·40	1·03	20·81
	1943	0·56	Nil.	Nil.	0·93	4·00	Nil.	Nil.	5·00	2·60	13·34	2·30	Nil.	28·73
	1944	Nil.	1·50	6·28	Nil.	0·42	2·50	3·40	Nil.	3·80	5·00	4·10	Nil.	27·00
	1945	Nil.	Nil.	Nil.	1·20	1·40	0·20	2·05	2·03	Nil.	2·40	1·30	Nil.	10·58
	1946	Nil.	Nil.	0·65	1·20	2·75	0·31	Nil.	2·10	Nil.	5·60	8·35	Nil.	20·96
	1947	Nil.	Nil.	0·20	0·80	1·95	0·05	2·60	5·83	6·99	4·60	1·20	Nil.	24·22
Total ..		0·56	1·50	7·13	7·67	12·51	4·86	8·05	18·46	15·29	36·59	18·65	1·03	132·30
Average ..		0·09	0·25	1·19	1·28	2·09	0·81	1·34	3·08	2·55	6·10	3·11	0·17	22·05

APPENDIX II—*cont.*

AVERAGE RAINFALL INCHES—NORTH SALEM DIVISION—FROM 1933 TO 1947—*cont.*

Name of station.	*Authority maintaining the station.*	*Year.*	*January.*	*February.*	*March.*	*April.*	*May.*	*June.*	*July.*	*August.*	*September.*	*October.*	*November.*	*December.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Urigam	....	1943	Nil.	Nil.	Nil.	0·10	4·60	Nil.	Nil.	3·20	4·60	12·96	1·10	Nil.	26·56
		1944	Nil.	0·30	3·17	0·20	1·40	1·10	0·42	0·50	7·40	1·40	2·50	Nil.	18·39
		1945	Nil.	Nil.	Nil.	1.80	1·70	Nil.	3·60	7·10	Nil.	6·75	Nil.	Nil.	20·95
		1946	0·10	Nil.	2·10	3·53	4·35	0·10	Nil.	0·79	Nil.	8·42	8·03	Nil.	27·42
	Total ..		0·10	0·30	5·27	5·63	12·05	1·20	4·02	11·59	12·00	29·53	11·63	Nil.	93·32
	Average ..		0·03	0·08	1·32	1·41	3·01	0·30	1·01	2·90	3·00	7·38	2·91	Nil.	23·33

STATEMENT SHOWING THE AVERAGE MAXIMUM AND MINIMUM TEMPERATURE IN NORTH SALEM DIVISION.

Denkanikota.

Months.	1934.		1935.		1936.		1937.		1938.		*Remarks.*
	Minimum.	*Maximum.*	*Minimum.*	*Maximum.*	*Minimum.*	*Maximum.*	*Minimum.*	*Maximum.*	*Minimum.*	*Maximum.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
January	66	74	64	72	67	76·5	66·5	77	66·5	75·5	Recording has been discontinued after December 1938.
February	66·5	76·5	70	79	68	81	71	78	66	77	
March	74	84	78	84·5	76	83	76	88	76	87	
April	80	88	81	90	80	88·5	73·5	83·5	76·5	88·5	Recordings are not available for Javalagiri and Aiyur.
May	79	87·5	76·5	83	80	87·5	84	73	80	88·5	
June	75	84·5	78	85	76·5	81·5	77	82	76	84·5	
July	75	81·4	77	82	75	82	73·5	80	74	82·5	
August	76	82	75	81	74	81	74	82·5	73·5	82	
September	76	84	73	85·5	76·5	82	75·5	82·5	75	83·5	
October	72	77	71	79	76	80	72·5	78	75	83·5	
November	67	73	67	75	70	75·5	68·5	79	68	76·5	
December	66	72	64	74	64	74	63	74·4	64	73·5	

APPENDIX III.

STATEMENT SHOWING THE CLASSIFICATION OF EACH RESERVED FOREST IN SALEM NORTH DIVISION AS MAJOR AND MINOR.

Number of Reserved Forest.	*Name of Reserved Forest.*	*Total area in acres.*	*Classification.*	
			Minor.	*Major.*
	Denkanikota East Range.			
40	Denkanikota	2,936	2,936	..
209	Denkanikota Extension	980	980	..
29	Aiyur	6,892	..	6,892
31	Gulhatti	8,028	..	8,028
206	Nyamasandiram Agraharam	424	..	424
66	Tholavubetta	8,109	..	8,109
32	Manchi	5,184	..	5,184
204	Kempakarai	6,474	6,474	..
202	Sameri	1,645	..	1,645
219	Aiyur Extension II	325	..	325
223	Aiyur Extension III	140	140	..
211	Aiyur Extension I	3,922	..	3,922
206	Tholavubetta Extension	1,168	..	1,168
	Total	46,227	10,530	35,697
	Denkanikota West Range.			
200	Sanamavu	4,794	4,794	..
208	Sanamavu Extension	9	9	..
39	Noganur	3,402	3,402	..
38	Thalli	8,160	..	8,160
126	Thalli Extension	3,168	..	3,168
37/1	Pane	17,387	..	17,387
203	Hulibanda	8,010	..	8,010
37/2	Javalagiri	7,763	..	7,763
	Total	52,693	8,205	44,488
	Krishnagiri Range.			
30	Marandahalli	6,176	..	6,176
215	Marandahalli Extension	8,098	2,018	6,080*
			Non-sandal.	
124	Galigattam	6,200	..	6,200
41	Maharajagadai	10,582	10,582	..
127	Maharajagadai Extension	1,542	1,542	..
42	Narlakota	6,876	6,876	..
43	Burgur	1,750	1,750	..
44	Kothur	4,206	4,206	..
77	Nandibanda	1,564	1,564	..
146	Medugampalli II part	36	36	..
194	Nerlapalli	3,736	3,736	..
210	Hudedurgam	8,596	8,596	..
	Total	59,362	40,906	18,456

* Outer slopes Minor Top plateau, Major.

Number of Reserved Forest.	*Name of Reserved Forest.*	*Total area in acres.*	*Minor.*	*Major.*
	Anchetti Range.			
67	Anchetti	9,554	9,554	..
69	Biligundlu	15,054	15,054	..
68	Natrapalayam	12,323	12,323	..
72	Mallahalli	9,964	9,964	..
71	Bilikal	13,426	13,426	..
70	Kestur	14,463	14,463	..
125	Kestur Extension	6,361	6,361	..
202	Urigam	7,984	..	7,984
73	Taggatti	10,728	10,728	..
172	Ubrani	11,940	11,940	..
33	Woddapatti	17,721	17,721	..
	Total	1,29,518	1,21,534	7,984

APPENDIX III—*cont.*

STATEMENT SHOWING THE CLASSIFICATION OF EACH RESERVED FOREST IN SALEM NORTH DIVISION AS MAJOR AND MINOR—*cont.*

Number of Reserved Forest.	*Name of Reserved Forest.*	*Total area in acres.*	*Classification.*	
			Minor.	*Major.*
	Dharmapuri Range.			
34	Pennagaram ..	12,744	12,744	..
	Pennagaram Extension	18	18	..
35	Guttirayan ..	14,669	11,000	3,669*
	Total ..	27,431	23,762	3,669

* Mainly Minor. The upper slopes are classified as Major because they contain semi evergreen forests of climatic nature.

102	Bevanurmalai	13,812	13,812	..
207	Bevanurmalai Extension I ..	203	203	..
213	Bevanurmalai Extension II	5	5	..
97	Masakal	9,650	9,650	..
103	Badamanadi ..	27,678	18,450	9,228*
214	Badamanadi Extension	425	425	..
104	Perubalai	8,304	8,304	..
105	Kalapambodi	9,360	9,360	..
106	Thoppur	9,801	9,801	..
81-A	Parigam A	3,460	3,460	..
B	Parigam B	13,167	13,167	..
135	Sigarahally Parapady-path	3	3	..
36	Morappur	19,314	19,314	..
95	Kesarguli	8,132	8,132	..
216	Kesarguli Extension	110	110	..
96	Pikkilimalai ..	5,469	5,469	..
	Total ..	1,56,324	1,43,427	12,897

* Portion of the river forms catchment area. As it falls under the definition "More remote climatic forests division. Hence classified as Major."

APPENDIX IV.

SANDAL FELLING SERIES—SILVICULTURAL MEASURES CARRIED OUT DURING THE PREVIOUS WORKING PLAN.

Year.		*Coupe number.*	*Area in acres.*	*Measures of tending.*	*Measures of Re-generation.*	*Measures of protection.*	*Miscellaneous.*
(1)		(2)	(3)	(4)	(5)	(6)	(7)
				1. *Aiyur North felling series.*			
				RS. A. P.			
1935–36	..	II	1,572	98 8 0	..	Fire lines were cleared.	....
1936–37	..	III		2 1 0	..	..	....
1937–38	..	I	1,453	90 13 0	..	..	....
				2. *Aiyur South felling series.*			
1935–36	..	II	874	55 2 0	..	Fire lines were cleared.	....
							In Aiyur Reserved Forest from 1936 to 1948, 38 fires burnt an area of 3,599 acres.
1936–37	..	III	1,548	96 12 0	..	....	....
1937–38	..	I	1,672	104 8 0	..	....	....
				3. *Tholavubetta felling series.*			
1935–36	..	II	855	53 7 0	..	Fire lines were cleared.	....
1936–37	..	III	973	60 13 0	..	....	....
1937–38	..	I	103	68 15 0	..	....	From 1936 to 1948, 37 fires burnt an area of 13,386 acres.

APPENDIX IV—*cont.*

Sandal Felling Series—Silvicultural Measures carried out during the Previous Working Plan—*cont.*

Year.	*Coupe number.*	*Area in acres.*	*Measures of tending.*	*Measures of Re-generation.*	*Measures of protection.*	*Miscellaneous.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			4. *Gulhatti East felling series.*			
			RS. A. P.			
1935–36 ..	II	416	26 0 0	..	Fire lines were cleared.	....
1936–37 ..	III	769	48 1 0	..	....	....
1937–38 ..	I	2,168	135 8 0	..	....	A latrine at Gulhatti rest house constructed at a cost of Rs. 69. Forest Guard's quarters at Gulhatti constructed at a cost of Rs. 747. Gulhatti-Manchi road constructed at a cost of Rs. 1,327–14–0.
			5. *Gulhatti West felling series.*			
1935–36 ..	II	2,063	128 15 0	..	Fire lines were cleared.	In Gulhatti Reserved Forest from 1936 to 1948, 43 fires burnt an area of 4,972 acres.
1936–37 ..	III	850	53 2 0	..	....	....
1937–38 ..	I	1,062	66 6 0	..	....	....
			6. *Kempakarai felling series.*			
1935–36 ..	II	1,122	70 2 0	..	Fire lines were cleared.	From 1936 to 1948, 15 fires burnt an area of 8,323 acres.
1936–37 ..	III	651	40 11 0	..	....	....
1937–38 ..	I	1,111	69 7 0	..	....	....
			7. *Denkanikota.*			
1935–36 ..	II	2,057	128 9 0	..	Fire lines were cleared.	One lac godown constructed at a cost of Rs. 1,567; final clearing shed constructed at a cost of Rs. 358; From 1936 to 1938, 4 fires burnt and area of 36 acres.
1936–37 ..	III	3,678	229 14 0	..	..	Lac godown constructed at a cost of Rs. 664. Lac factory constructed at a cost of Rs. 280. (These are now under Provincial Silviculturist).
1937–38 ..	I	1,738	108 10 0	..	..	Motor lorry shed Rs. 359. Office building (Deputy Tahsildar's) purchased for Rs. 5,129–14–0.
			8. *Thalli North felling series.*			
1935–36 ..	II	1,589	99 15 0	..	Fire lines were cleared.	....
1936–37 ..	III	1,606	100 6 0	..	..	....
1937–38 ..	I	2,760	172 8 0	..	..	....
			9. *Thalli South felling series.*			
1935–36 ..	II	1,186	74 2 0	..	All lines were cleared.	One latrine at Deverbetta Rest house constructed at a cost of Rs. 92.
1936–37 ..	III	1,255	78 7 0	..	..	In Thalli Reserved Forest from 1936 to 1948, 70 fires burnt an area of 9,218 acres.
1937–38 ..	I	2,136	133 8 0	..	..	....
			10. *Javalagiri North felling series.*			
1935–36 ..	II	995	62 3 0	..	All lines were cleared.	....
1936–37 ..	III	719	44 15 0	..	..	....
1937–38 ..	I	1,035	64 11 0	..	..	....
			11. *Javalagiri South felling series.*			
1935–36 ..	II	1,439	89 15 0	..	All lines were cleared.	In Javalagiri Reserved forest, 91 fires burnt an area of 7,258 acres from 1936 to 1948.
1936–37 ..	III	1,823	113 15 0	..	..	....
1937–38 ..	I	733	45 13 0	..	..	....
			12. *Pane West felling series.*			
1935–36 ..	II	1,781	111 5 0	..	All lines were cleared.	....
1936–37 ..	III	1,353	84 9 0	..	..	....
1937–38 ..	I	1,487	92 15 0		..	....

APPENDIX IV—*cont.*

SANDAL FELLING SERIES—SILVICULTURAL MEASURES CARRIED OUT DURING THE PREVIOUS WORKING PLAN—*cont.*

Year. (1)	*Coupe number.* (2)	*Area in acres.* (3)	*Measures of tending.* (4)	*Measures of Re-generation.* (5)	*Measures of protection.* (6)	*Miscellaneous.* (7)
			RS. A. P.			
			13. *Pane East felling series.*			
1935–36 ..	II	2,841	177 9 0	..	All lines were cleared.	In Pane Reserved Forest, 88 fires burnt an area of 11,033 acres from 1936 to 1948.
1936–37 ..	III	874	54 10 0	..	..	....
1937–38 ..	I	898	56 2 0	..	..	....
			14. *Hulibanda felling series.*			
1935–36 ..	II	295	18 7 0	..	All lines were cleared.	Fifty-three fires burnt an area of 5,864 acres from 1936 to 1948.
1936–37 ..	III	1,582	98 14 0	..	..	....
1937–38 ..	I	1,184	74 0 0	..	..	....
			15. *Panjapalli felling series.*			
1935–36 ..	II	652	40 12 0	..	All lines were cleared.	....
1936–37 ..	III	960	60 0 0	..	..	Seventeen fires burnt an area of 569 acres from 1936 to 1948.
1937–38 ..	I	1,112	69 8 0	..	..	....
			16. *Marandahalli felling series.*			
1935–36 ..	II	733	45 13 0	..	All lines were cleared.	....
1936–37 ..	III	960	60 0 0		..	Twenty-two fires burnt an area of 1,603 acres from 1936 to 1948.
1937–38 ..	I	975	60 15 0	..	....	....
			17. *Galigattam felling series.*			
1935–36 ..	II	635	39 11 0	..	All lines were cleared.	....
1936–37 ..	III	1,390	86 14 0	..	..	Thirty-six fires from 1936 to 1948 burnt an area of 1,578 acres.
1937–38 ..	I	1,463	91 7 0	..	..	....
			18. *Morappur felling series.*			
1935–36 ..	II	Not done.	..	..	..	....
1936–37 ..	II	2,281	142 9 0	..	..	Fifteen fires burnt an area of 1,345 acres from 1936 to 1948.
1936–37 ..	III	984	61 8 0	..	..	....
1937–38 ..	I	1,031	64 7 0	..	..	....
			19. *Guttirayan felling series.*			
1935–36 ..	II	Not done.	..	..	..	....
1936–37 ..	II	1,147	71 11 0	..	All lines were cleared.	Twenty-four fires burnt an area of 12,664 acres from 1936 to 1948.
1936–37 ..	III	1,145	71 9 0	..	..	Latrine for Kodagarai rest-house constructed at a cost of Rs. 56.
1937–38 ..	I	514	32 2 0	..	..	....
			20. *Anchetti felling series.*			
1935–36 ..	II	1,307	81 11 0	..	All lines were cleared.	Latrine for Anchetti rest-house constructed at a cost of Rs. 69.
1936–37 ..	III	1,774	110 14 0	..	..	Forty-two fires burnt an area of 9,559 acres from 1936 to 1948.
1937–38 ..	I	507	31 11 0	..	..	Latrine for Geratti rest-house constructed at a cost of Rs. 71.
			21. *Urigam felling series.*			
1935–36 ..	II	1,778	111 2 0	..	All lines were cleared.	Sixty fires burnt an area of 7,707 acres from 1936 to 1948.
1936–37 ..	III	718	44 14 0	..	..	Latrine at Urigam rest-house constructed at a cost of Rs. 74.
1937–38 ..	I	1,348	84 4 0	..	..	Forest Guard's quarters at Ootumalai constructed at a cost of Rs. 678.

APPENDIX V.

STATEMENT SHOWING THE RESERVED SANDALWOOD TREES IN PATTA LANDS.

Serial number and name of taluk.	*Name of village.*	*Field number.*	*Class I.* *Fields assigned before 7th March 1917.*			*Class II.* *Fields assigned after 7th March 1917 and before 19th February 1919.*			*Class III.* *Fields assigned after 19th February 1919 and before 19th September 1924.*			*Class IV.* *Fields assigned between 19th February 1924 and 16th January 1925.*		
			Survey number.	*Extent in acres.*	*Number of trees.*	*Survey number.*	*Extent in acres.*	*Number of trees.*	*Survey number.*	*Extent in acres.*	*Number of trees.*	*Survey number.*	*Extent in acres.*	*Number of trees.*
1 Hosur	Kottaimadugu	66	..	..	..	158/2	2·2	2	..	..	..	..	..	..
2 Do.	Ulumaranapalli	64	..	..	..	..	..	..	..	..	..	..	..	..
3 Do.	Chudasandiram	68	..	..	..	..	..	..	..	..	..	..	..	..
4 Do.	Achubal	96	..	..	..	..	..	..	..	..	..	..	..	..
5 Do.	Doddanbbanur	61	..	..	..	..	..	..	..	..	..	..	..	..
6 Do.	Kuppatti	70	..	..	..	..	..	..	..	..	..	..	..	..
7 Do.	Uddanapalli	3	900	2·90	8	..	..	..	..	..	..	..	..	..
8 Do.	Kamandoddy	7	..	..	..	..	..	..	..	..	..	..	..	..
9 Do.	Ayranapalli	2	..	..	..	..	..	..	..	..	..	..	..	..
10 Do.	Mookandapalli	15	..	..	..	..	..	..	247/2A	0·35	9	..	..	..
11 Do.	Jujubadi	12	469	0·35	2	..	..	..	..	..	..	..	..	..
			470	0·28	1	..	..	..	..	..	..	..	..	..
			521/1	0·19	1	..	..	..	..	..	..	..	..	..
			593	0·33	1	..	..	..	..	..	..	..	..	..
			609/5	0·14	2	..	..	..	..	..	..	..	..	..
			606	1·56	4	..	..	..	..	..	..	..	..	..
			613	0·94	1	..	..	..	..	..	..	..	..	..
			615	1·42	11	..	..	..	..	..	..	..	..	..
			621	1·77	23	..	..	..	..	..	..	..	..	..
			617/1	0·28	2	..	..	..	..	..	..	..	..	..
			620	0·53	2	..	..	..	..	..	..	..	..	..
			619/1	1·03	1	..	..	..	..	..	..	..	..	..
			402/1	3·96	4	..	..	..	..	..	..	..	..	..
			403	0·69	1	..	..	..	..	..	..	..	..	..
			408/1	1·28	2	..	..	..	..	..	..	..	..	..
			407	0·51	2	..	..	..	..	..	..	..	..	..
			427/B	0·28	12	..	..	..	..	..	..	..	..	..
12 Do.	Muthuganapalli	34	..	..	..	..	..	..	..	..	..	..	..	..
13 Do.	Onnalvadi	20	..	..	..	..	..	..	..	..	..	..	..	..
14 Do.	Anchetti	90	..	..	..	..	..	..	..	..	..	..	..	..
15 Do.	Thallikotham	71	..	..	..	..	..	..	1,096	0·59	2	..	..	..
16 Do.	Thondrai	48	..	..	..	..	..	..	..	..	..	..	..	..
17 Do.	Mornapalli	9	179/1	2·73	12	..	..	..	..	..	..	..	..	..
			470	3·2	15	..	..	..	..	..	..	..	..	..
18 Do.	Nagandapalli	58	201	..	1	..	..	..	..	..	..	..	..	..
			159/3	..	1	..	..	..	199/2A	..	4	..	..	..
19 Do.	Aunialam	41	..	..	..	..	..	..	..	..	..	..	..	..
20 Do.	Sarandapalli	39	..	..	..	..	..	..	..	..	..	..	..	..
21 Do.	Mallasandiram	46	..	..	..	..	..	..	741/2	0·23	1	..	..	..
22 Do.	Denkanikota	34	..	..	..	..	..	..	..	..	..	..	..	..
23 Do.	Arasakuppam	43	..	..	..	..	..	..	..	..	..	..	..	..
24 Do.	Urigam	93	..	..	..	..	..	..	..	..	..	..	..	..
25 Do.	Manchikondapalle	95	70/2	3·18	11	..	..	..	..	..	..	..	..	..
26 Dharmapuri	Ramagadahalli	102	..	..	..	..	..	..	..	..	..	..	..	..

APPENDIX V—*cont.*

STATEMENT SHOWING THE RESERVED SANDALWOOD TREES IN PATTA LANDS—*cont.*

Serial number and name of taluk.	Name of village.	Field number.	Class V. Fields assigned between 16th January 1926 and 24th July 1928. Survey number.	Extent in acres.	Number of trees.	Class VI. Fields assigned between 24th July 1928 and 6th December 1932. Survey number.	Extent in acres.	Number of trees.	Class VII. Fields assigned after 6th December 1932. Survey number.	Extent in acres.	Number of trees.
1 Hosur	Kottaimadugu	66	..	..	..	..	..	..	..	..	..
Do.	Ulumaranapalli	64	535/A	2·45	15	..	..	..	..	..	..
			520	1·17	1						
			521	0·77	1						
3 Do.	Chudasandiram	68	..	..	..	27/3	1·47	22	..	..	..
						176/3	2·42	1			
4 Do.	Achubal	96	..	..	..	57/2	0·93	6	4/1	7·68	3
									60/6	8·14	3
									89/4	4·54	1
									58/6	3·2	1
									224/2	2·76	1
									214/3	2·85	1
									398	4·85	1
									217/2	4·67	1
									437/B2	2·37	1
									451/2	1·84	4
									582/2D	6·45	1
5 Do.	Doddanbbanur	61	..	..	..	..	..	..			
6 Do.	Kuppatti	70	..	..	..	..	..	..			
7 Do.	Uddanapalli	3	..	..	..	..	..	..	..		
8 Do.	Kamandoddy	7	..	..	..	..	..	..	9/2	2·5	5
9 Do.	Ayranapalli	2	..	..	..	..	..	..	76/1	4·54	6
10 Do.	Mookandapalli	15	..	..	..	..	..	..	156	1·81	3
									157/1	2·15	2
11 Do.	Jujuvadi	12	..	..	..	..	..	..	..	..	..
12 Do.	Muthuganapalli	54	578/2A	0·28	7	..	..	..	..	..	..
13 Do.	Onnalvadi	20	174/1	3·4	6	..	..	..	177/1	1	4
			236/2	0·15	1						
			147	2·27	5						
			64/1	3·52	1						
			519	0·71	3						
14 Do.	Anchetti	90	..	..	..	..	..	..	451	0·11	1
15 Do.	Thalikotham	71	..	..	..	..	..	..	..	..	..
16 Do.	Thondrai	48	..	..	..	..	..	..	470/1A	0·46	1
									640/1	0·81	5
									640/3	0·91	1
									641	1·75	1
									652	1·49	1
17 Do.	Maranapalli	9	..	..	..	..	..	..	..	..	..
18 Do.	Nagandapalli	58	..	..	..	..	..	..	..	..	..
19 Do.	Avnialam	41	..	..	..	..	..	..	458	0·80	1
20 Do.	Sarandapalli	39	273	2·16	7	..	..	..	..	..	..
21 Do.	Mallasandiram	46	..	..	..	..	..	..	..	..	..
22 Do.	Denkanikota	34	504	1·13	4	..	..	..	..	..	..
			506	0·47	1	..	..	..	..	..	..
			503	1·32	5	..	..	..	..	..	..
			560	3·39	1	..	..	..	596	0·54	1

23 Do.	Arasakuppam	43	158	0·59	2	493/B1 1100/1	2·2 0·24	12 3	..	..	..
24 Do.	Urigam	93	243/5	0·31	2	90/2 44/1 42/2 17/3 316	2·17 0·62 4·76 0·54 0·2	2 3 1 1 8	..	..	..
25 Do.	Manchikondapalli	95	87/1	5·36	3	..	..	..	8/3 71/6 4/2	1·33 1·45 4·12	1 1 14
26 Dharmapuri	Ramagadahalli	102	..	..	..	..	..	..	..	..	..

APPENDIX VI.

Control book for the Sandal Working Circle.

Operations in

Prescriptions. *Work done.*

A. Routine—

(1) Uprootal of dead trees, only removal of fallen and broken-branches containing heart-wood.

(2) Extraction and depot procedure to be governed by the Sandalwood working rules.

(3) Exploitation to be regulated by area in the order laid out in paragraph

Sample tabular statement of coupes prescribed and worked.

Range.	*Name of felling series.*	*Prescribed.*		*Worked.*		*Outturn in lb.*	*Control.*
		Coupe No.	*Acreage.*	*Coupe No.*	*Acreage.*		*Deviations, if any, with authority and brief reasons.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Reserve Series.			
Denkanikota West	Javalagiri	I	3,974				
	Pane	I	2,482				
Denkanikota East	Gulhatti	I	3,122				
	Aiyur	I	3,475				
	Kempakarai	I	1,168				
	Denkanikota	I	1,613				
Dharmapuri	Guttirayan	I	2,202				
Krishnagiri	Marandahalli	I	3,581				
Anchetti	Urigam	I	3,633				
	Anchetti	I	4,012				
				Unreserve Series.			
Denkanikota West	Achubal	I	1,348				
Denkanikota East	Kachuvadi	I	2,611				
	Manchi	I	1,496				
Krishnagiri	Bettamugulalam.	I	1,248				
Anchetti	Natrapalayam	I	4,768				

Note.—Similar statements will be maintained for every year noting the coupe and acreage worked.

APPENDIX VI—*cont.*

Record of works for the Sandal Working Circle .

Operations in

Prescriptions.	*Work done.*
A. Routine—	
(1) Tending of sandal to be done in the coupes due for exploitation progressively with the enumeration.	
(2) Tending to be regulated with the area of coupe	
(3) Five propagation centres are to be made in each of the specified beats ..	
(4) Definite rules as regards site, size, preparation, season of sowing and treatment of propagation centres are laid down in paragraphs	
B. A graph showing the yield to be drawn	

Sandal Working Circle Felling series journal.

Year.	Name of felling series.	Coupe number.	Extraction.					
			Number of trees extracted.		Girth 0 inch to 6 inches.			
					Complete.		Incomplete.	
			Complete.	Incomplete.	Number.	Outturn.	Number.	Outturn.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

Extraction—*cont.*											
Girth 6 inches to 12 inches.				Girth 12 inches to 18 inches.				Girth 18 inches to 24 inches.			
Complete.		Incomplete.		Complete.		Incomplete.		Complete.		Incomplete.	
Number.	Outturn.	Number.	Outturn.	Number.	Outturn.	Number.	Outturn.	Number.	Outturn.	Number.	Outturn.
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)

Extraction—*cont.*											
Girth 24 inches to 30 inches.				Girth 30 inches to 36 inches.				Girth 36 inches to 42 inches.			
Complete.		Incomplete.		Complete.		Incomplete.		Complete.		Incomplete.	
Number.	Outturn.	Number.	Outturn.	Number.	Outturn.	Number.	Outturn.	Number.	Outturn.	Number.	Outturn.
(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)

Total		Tending.		Remarks.
Number of trees.	Outturn.	Nature of work done.	Date.	
(34)	(35)	(36)	(37)	(38)

APPENDIX VI—*cont.*

Propagation Centres Journal.

Year.	Name of reserve.	Locality.	Propagation centre.		
			Serial number.	Size.	Origin of seed.
(1)	(2)	(3)	(4)	(5)	(6)

Name of host species used.	Date of sowing.		Date of first germination of sandal.	Date of competition of germination of sandal.
	Sandal.	Host.		
(7)	(8)	(9)	(10)	(11)

Replacement of casualties.		Survivals at the beginning of the second monsoon.		Survivals at the beginning of the third monsoon.		Cost.	Remarks.
Date.	Number of seedlings.	Date of enumeration.	Number of seedlings.	Date of enumeration.	Number of seedlings.		
(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)

CONTROL BOOK FOR THE BAMBOO WORKING CIRCLE.

Operations in

Prescriptions.	*Work done.*

A. Routine—

(1) Fellings shall normally be made through the agency of contractors .. ..
In special cases especially in the village section, permit fellings under proper supervision may be allowed.

(2) The exploitation by contractors shall be regulated entirely by area, one coupe being worked annually in the order laid down.

Tabular control statement of working by contractor.

Range.	Number of felling series.	Prescribed.		Work done.				Control.
		Coupe number.	Area.	Coupe number.	Area.	Outturn : (number of bamboos exploited).	Price realised.	Deviations if any with authority and reasons.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

(3) Felling rules are laid down in paragraph (under work done any infringements should be recorded).

(4) Road making by contractors must be along approved alignments with the written permission of the District Forest Officer.

APPENDIX VI—*cont.*

CONTROL BOOK FOR THE FUEL WORKING CIRCLE.

Operations in

Prescriptions. *Work done.*

A. Routine—

(1) Fellings will invariably be made through the agency of contractors; the lease will be for 12 months.

(2) Fellings will be by simple coppice hosts with reservation of sandal, few hosts around it and tamarind, Poochankottai, Jalari and Gothi, etc.

(3) Fellings will be regulated entirely by area—one coupe being worked annually in each series in the sequence laid down.

(4) Arrear coupes of previous year are normally to be sold with the current year's coupes.

Range.	Name of felling series.	Prescribed. Coupe number.	Prescribed. Area.	Work done. Coupe number.	Work done. Area.	Work done. Outturn in tons.	Work done. Price obtained.	Control. Deviations if any with authority and reasons.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			ACS.					
Denkanikota West.	Sanamavu ..	I	80					
	Arrears.							
Dharmapuri ..	Perumbalaimalai	I	100					
	Arrears.							
	Bevanur ..	I	80					
	Arrears.							
	Cauvery Valley	I	80					
	Arrears.							
	Masakal ..	I	80					
	Arrears.							
	Parigam ..	I	80					
	Arrears							
	Badanavadi ..	I	100					
	Arrears.							
	Thoppur ..	I	100					
	Arrears.							
	Pennagaram ..	I	80					
	Arrears.							
Krishnagiri ..	Hudedurgam ..	I	60					
	Arrears.							
	Kothur ..	I	45					
	Arrears.							
	Maharajagadai (East).	I	125					
	Arrears.							
	Maharajagadai (West).	I	125					
	Arrears.							
	Nandibanda ..	I	45					
	Arrears.							
	Narlapalli ..	I	80					
	Arrears.							
	Burgur ..	I	45					
	Arrears.							

(5) Each coupe will be divided into a convenient number of strips, but not less than two and not more than four. On slopes the strip lines should run across contours. Felling will proceed strip by strip.

(6) Detailed felling rules are prescribed in paragraph (any infringement may be noted).

(7) Felling firewood should be bileted and stacked. Removal of billets over 6 inches in girth before stacking is prohibited.

(8) Trees converted into timber shall be hammer marked .. ..

APPENDIX VI—*cont.*

Records of Works for the Fuel Working Circle.

Operations in

Prescriptions.	*Work done.*
A. Routine—	
(1) Survey and demarcation of coupes to be felled in the following year, should be done before December.	
(2) Worked coupes are to be demarcated with stone slabs	
(3) The stools hidden by felled slash shall be freed	

Sample forms of control records to be maintained under the Fuel Conversion Working Circle.

1 Kumri allotment register—

(*a*) Locality.
(*b*) Year of allotment.
(*c*) Name of kumridar.
(*d*) Father's name.
(*e*) Village or hamlet.
(*f*) Area allotted.
(*g*) Food crop obtained.
(*h*) Value of food crop.
(*i*) Remarks.

2 Control journal—

This register should contain—

(1) Index, (2) Sketch, (3) Description of the plot, (4) Dates of sowing and replacing casualties, (5) Statement showing details of work and cost, (6) Notes of inspection. (7) A 4-inch scale map showing the position of kumris with reference to known points shall be attached.

Sample Form of the "Index."

Index.

Name of regeneration area.

Number of plot.	*Year of formation.*	*Area in acres.*	*Method of regeneration.*	*Page number.*
(1)	(2)	(3)	(4)	(5)

3 Plot files with following details shall also be maintained :—

Plot No.

Details of work done.

Year.

Nature of work.	*Date.*	*Details of work done.*	*Remarks.*
Clear felling			
Cutting slash and heaping			
Burning			
Formation of patches or lines			
Espacement			
Preparation of tree crop lines			
Sowing			
Ploughing the area between the lines ..			
Sowing of field crop			
First weeding and soil working ..			
Second weeding and soil working ..			

APPENDIX VI—*cont.*

Record of Works for the Plantation Working Circle.

Separate records shall be maintained for each operations in

Prescriptions. *Work done.*

A. Routine—

(1) Selection and demarcation of area to be planted up in the following year should be completed not later than August with reference to the map.

(2) All regenerated areas shall be demarcated with stone slabs or sign boards as the case may be sandal.

(3) All sandal heartwood trees found in the area will be enumerated and extracted before clear-felling the growth in the areas.

(4) The standing growth shall be sold for firewood, extraction in case of demand or clear felled departmentally.

(5) If the standing growth is sold for extraction (over 6 inches girth only) the lease period shall end with December.

(6) The area shall be burnt in April .. ..

(7) The area shall be aligned and staked at 6 feet by 6 feet .. ..

(8) Planting stumps/transplants shall be done in May/September .. .. ..

(9) Casualties shall be replaced every month in both the monsoons .. .. ..

(10) Weeding and soil working shall be done in July, September and December ..

(11) The plantation shall be thinned or pruned at the discretion of the District Forest Officer after inspection.

Regeneration ledger.

Teak
Softwood — Plantation Working Circle.
Casuarina.

Range :

Reserve :

(1) Extent of area regenerated .. ..

(2) Dates of clear felling .. ..

(3) Dates of burning .. ..

(4) Dates of aligning and staking .. ..

(5) Espacement .. ..

(6) Dates of planting .. ..

(7) Dates of replacement of casualties .. ..

(8) Dates of weeding and soil aeration .. ..

(9) Rate of daily wage .. ..

(10) Names of subordinate in charge .. ..

(11) Percentage of survivals in the second year, third year .. ..

Cost of					
Year and month.	Clear felling.	Burning, etc.	Aligning and staking.	Planting.	Replacing casualties.
(1)	(2)	(3)	(4)	(5)	(6)

Cost of—*cont.*						
Weeding and soil aeration.	Fire protection.	Other expenses.	Revenue (if any).	Monthly total of expenditure.	Monthly rainfall at the nearest rainguage station.	Remarks. (State here the quantity of sandalwood extracted and also the yield of firewood and its revenue.)

APPENDIX VI—*cont.*

1. CONTROL BOOK FOR THE LAC WORKING CIRCLE.

Prescriptions. *Work done.*

A. Routine—

(1) The working will be regulated by the quantity of brood .. ..

(2) The sequence of injection as shown in the tabular statement shall be followed ..

(3) In the case of *Schleichera trijuga,* the crop-cutting and the pruning shall be combined.

In the case of *Zizyphus jujuba* pruning shall be done 1½ years after the crop-cutting.

(4) Rules of pruning is given in para. .. ..

2. LEDGER.

Lac Working Circle.

Name of crop :

Name of locality and group :

Number of trees pruned :

Number of trees inoculated :

Date of inoculation :

Name of brood used :

Quantity of brood lac used :

Date of swarming of the brood :

Date of removal of stick lac :

Date of male swarming :

Period taken for the males to swarm since inoculation .

Date of swarming of the new brood.

Period taken for the crop to mature :

Number of trees from which crop was harvested.

Quantity of cleaned brood lac obtained.

Quantity of scrapped lac obtained.

Name of subordinate in charge :

Rate of coolie wage :

Other details.

Year.	Value of brood used.	Packing transport, etc., charges.	Inoculation charges.	Removal of stick lac.	Cost of harvesting, etc.	Cost of control of enemies.
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Cost of scraping and washing.	Miscellaneous expenses.	Total.	Total yield obtained.	Revenue realised.	Remarks
(8)	(9)	(10)	(11)	(12)	(13)

APPENDIX VI—*cont.*

CONTROL BOOK FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

Operations in

Prescriptions. *Work done.*

A. Routine—

(1) All items of minor produce, except deer and sambhur horns, will be collected through the agency of contractors.

(2) The barks of *Cassia fistula, Cassia auriculata, Ventilago madraspatana,* and the fruits of *Sapindus emarginata, Terminalia chebula,* honey wax and deer and sambhur horns will be exploited from both reserves and unreserves. Other items shall be removed only from reserves.

(3) Tamarind will be separately exploited from 18 farms annually on a lease of 8 months from November to 30th June. The sale should be held in October.

(4) *Cassia fistula* will be worked in range unit including unreserves on a rotation of five years in the order laid down in para.

(5) *Cassia auriculata, Ventilago madraspatana* and *Strychnos nux-vomica* will annually be leased out jointly for each range unit including unreserves.

(6) Other items will be clubbed together and leased out annually for each range unit.

(7) The Ubrani Agraharam will be treated as a separate unit for purpose of lease.

B. Discretionary—

(1) The District Forest Officer has discretion to lease the right to collect any produce as a separate item.

(2) The District Forest Officer has discretion to lease out items of produce of the Ubrani Agraharam jointly or separately.

APPENDIX VI—*cont.*

1. Control book for Grazing Working Circle.

Operations in

Prescriptions.	*Work done.*
. Routine—	
(1) Grazing and Penning shall be regulated by issue of permits	
(2) Worked coupes in the fuel working circle shall be closed to grazing for four years, including the year of felling.	
(3) Plantations, in the teak, softwood and Casuarina Working Circles and any area taken up for experiments by the Provincial Silviculturist will be closed to grazing during the period of this plan.	
(4) Rotational grazing blocks shall be closed to ordinary cattle	
(5) Fuel Kumris shall be closed to grazing for seven years (i.e., two years after kumridar vacates).	
(6) Revenue realised, details of cattle licensed	
B. Discretionary—	
The District Forest Officer may close particular areas to grazing for temporary periods for various reasons.	

2. Records of works for the Grazing Working Circle.

Prescriptions.	*Work done.*
A. Routine—	
(1) Annual programme for improving water facilities in pens is laid out in paragraph	
(2) All areas closed to grazing either temporarily or permanently should be marked off on the ground with red sign boards placed at salient corners.	
(3) The rotational grazing system shall be introduced in stage, paragraph ..	
(4) Fee of As. 6 a cow unit shall be charged for cattle grazing in the fringe forest rotational grazing blocks.	
(5) Cattle penned under penning block system shall be charged a penning fee of Re. 1 per 100 heads until the system is introduced to all pens and the public get used to it.	
(6) Cattle shall be grazed for one month at a time in rotational blocks	
(7) Cattle shall not return to a new block which has not been closed for at least 6 weeks.	
(8) The boundaries of the paddocks shall be clearly demarcated on the ground ..	
(9) Each block shall be divided into three paddocks	
(10) Each paddock in the penning block system should have a pen. Cattle shall be penned in half of the pen site for the first month and in the second half in the second month of occupation of the pen.	
(11) All materials required for constructing sheds and fences, etc., shall be allowed to be removed free of charge.	
(12) When the grazing in one block is exhausted, the District Forest Officer may permit the cattle to enter the next paddock subject to the condition under item (7) above.	
(13) Annually grass seeds should be sown in blank patches in these paddocks ..	
(14) Cutting and removal of fodder grass shall be permitted in head loads.. ..	

Miscellaneous Regulations.

Operations in

Prescriptions.	*Work done.*
A. Routine—	
(1) The clearing of existing fire lines to a width of 6 feet is prescribed as a measure of general fire protection. A general list of such foot-path is given.	
(2) The other periphery of the entire planted casuarina will be fire-traced by cutting a fifteen feet wide line and burning the cut material in the line in January each year.	
(3) The outer periphery of the planted teak areas shall be fire-traced to a width of 15 feet before the end of January each year.	
(4) The outer periphery of the planted softwood areas shall be fire-traced to a width of 15 feet before the end of January each year.	
(5) The proper maintenance of roads and bridle paths is prescribed	

APPENDIX VI—*cont.*

Miscellaneous Regulations—*cont.*

Operations in

Prescriptions. *Work done.*

A. Routine—

(6) A programme for construction of new roads is laid down. Years of construction are suggested.

(7) A programme for construction of buildings is given. Years of construction are suggested.

(8) The clearing and maintenance of reserve boundaries is laid down .. ..

(9) The maintenance and posting of control records and maps for the various Working Circle dealt with in this working plan, shall be posted up to date is prescribed.

(10) The maintenance of forest raingauge stations is prescribed. Daily record of rainfall shall be kept at each station.

Deviation Statement.

North Salem Working Plan.

Year.	Working Circle.	Prescriptions.	Nature of deviations.	Reasons for deviations.	Remarks or any possible action to remedy the deviation.	Number and date of order sanctioning the deviation.
(1)	(2)	(3)	(4)	(5)	(6)	(7)

APPENDIX VII.

G.O. Mis. No. 227, *Development, dated* 26*th January* 1948.

(Cutting and removal of grass from reserved forests under the Control of the Forest Department.)

The present policy of Government in regard to this matter is perhaps not generally known to the public. Cutting and removal of grass in head-loads are permitted from the reserved forests except in areas which are closed for Silvicultural reasons or for abuse of the concession. No removal will also be permissible from coupes under felling, in young plantations, in sandalwood propagation centres and such other areas which may be closed by the District Forest Officer, for special reasons. The removal of grass in cart-loads is not ordinarily permitted. Even this is however permitted in a few forest divisions subject to the payment of prescribed fee. Where it is the practice to lease grass the lessee will be required to agree to free removal by the public in head loads. The Concession and the closed areas are notified by the District Forest Officer annually in the District Gazete.

The removal of grass will be subject to the following conditions :—

(i) The removal of grass shall be allowed free only in head-loads and for domestic use and not for sale. Removal in cartloads may be made only from areas in which it is specially allowed. Such removal shall be made from areas closed to grass cuttings.

(ii) Removals may be made throught the year but they shall not be made before dawn or after dusk. No permits will be required.

(iii) Only long grass shall be cut, it shall not be uprooted. Only sickles be used. Billhooks and felling axes shall not be carried.

(iv) No forest produce shall be cut to stiffen or to tie the bundles.

(v) Removals shall be made only through recognized foot paths or roads which will be notified in the District Gazette.

Proceedings of the Chief Conservator of Forests

Proceedings Mis. No. 72, 5th February 1953

Working Plan—Salem North Division—Sanctioned.

Sri M. KESAVAN UNNI NAYAR, I.F.S.,
Chief Conservator of Forests.

Proceedings—Mis. No. 72, dated 5th February 1953.

Sanctioned.

M. KESAVAN UNNI NAYAR,
Chief Conservator of Forests.

(True copy)

Personal Assistant.

To the Conservator of Forests, Working Plans Circle.
" Conservator of Forests, Salem Circle.
" District Forest Officer, Salem North.